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DETROIT

TELEPHONE ENGINEER

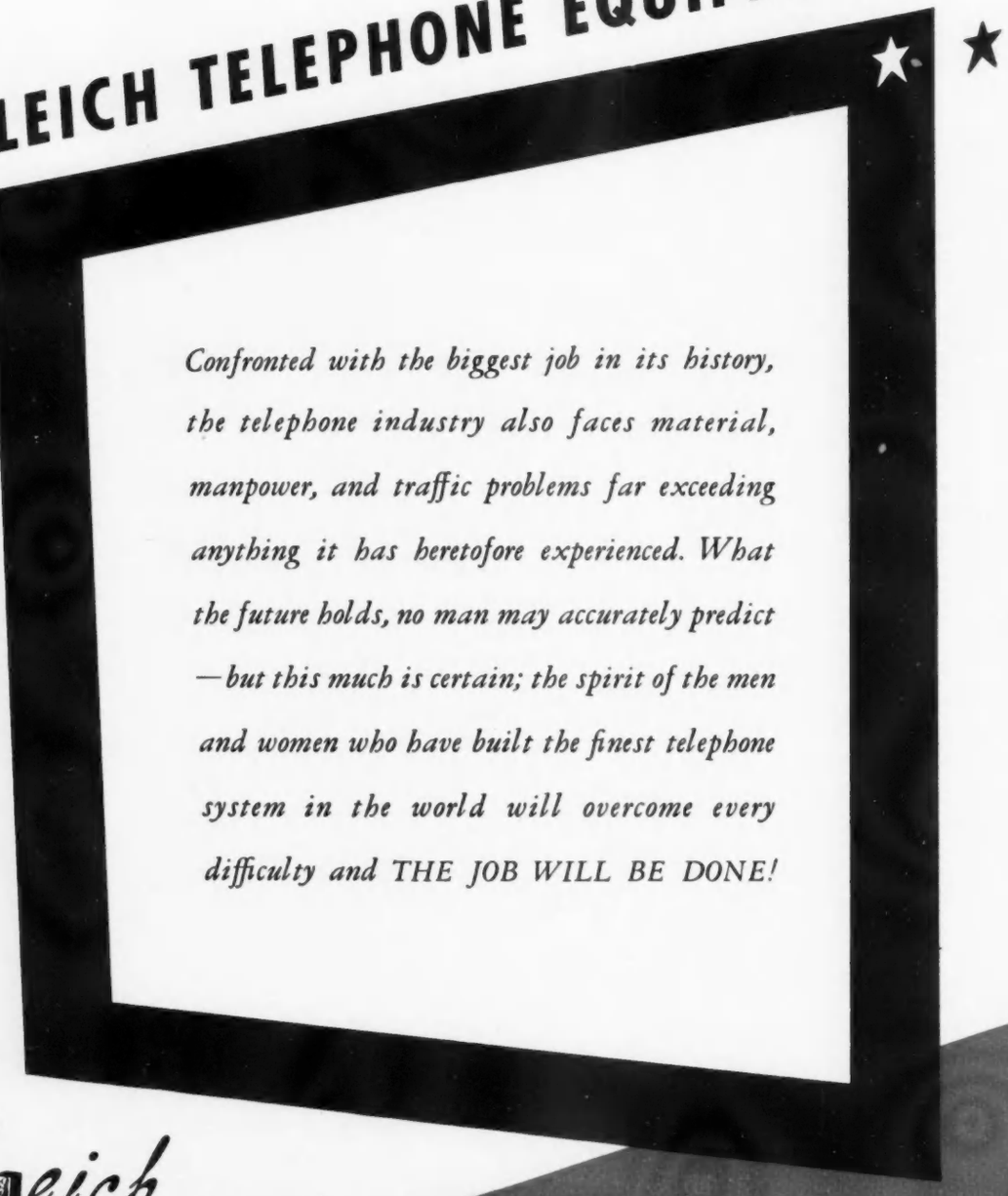
MANAGEMENT

THE NATIONAL TELEPHONE MAGAZINE

CONVENTION REPORT **OCTOBER 15, 1942**

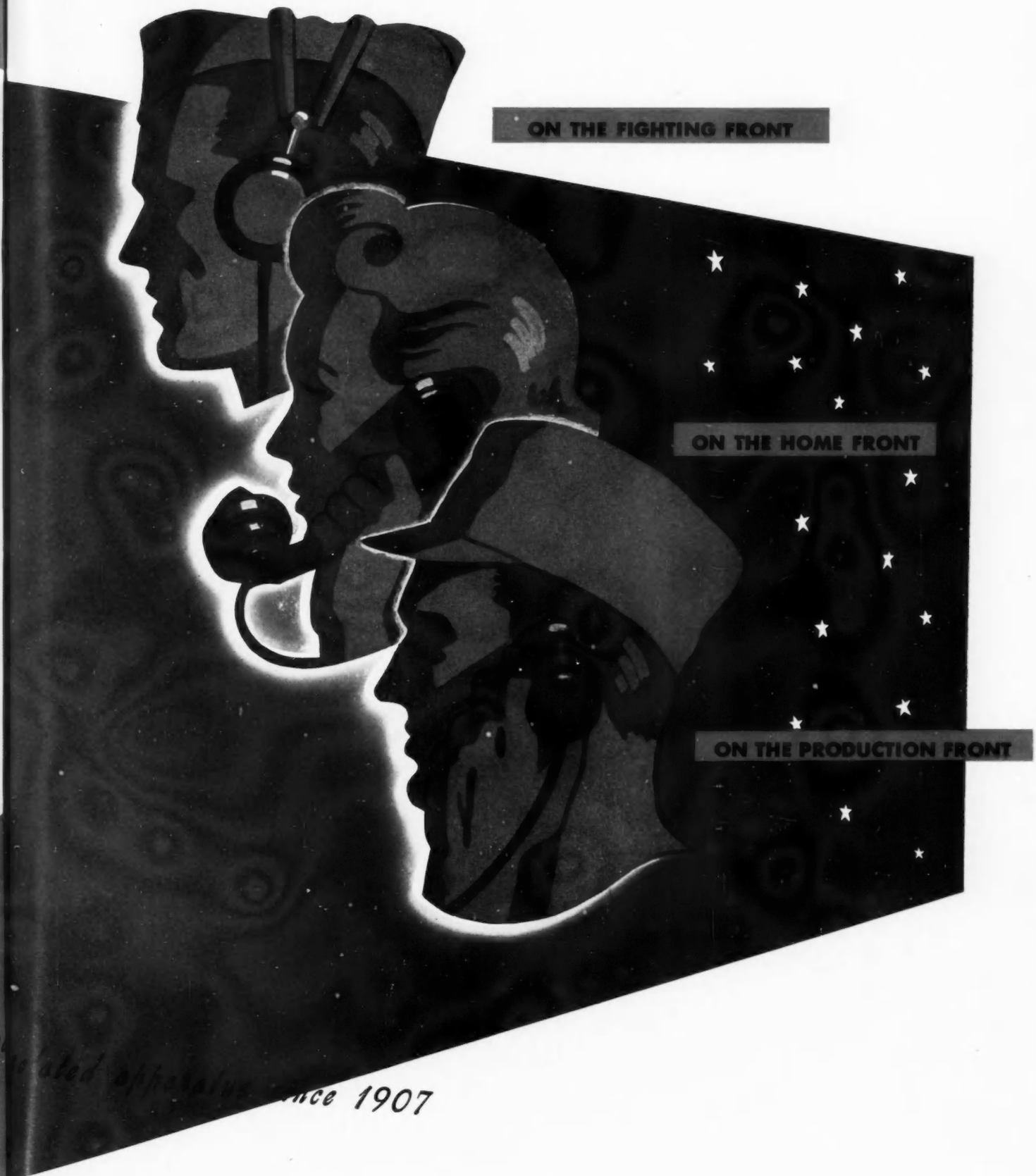
Entered as Second Class Matter at the Post Office at Pontiac, Ill., under the Act of March 3, 1879.

LEICH TELEPHONE EQUIPMENT



Confronted with the biggest job in its history, the telephone industry also faces material, manpower, and traffic problems far exceeding anything it has heretofore experienced. What the future holds, no man may accurately predict —but this much is certain; the spirit of the men and women who have built the finest telephone system in the world will overcome every difficulty and THE JOB WILL BE DONE!

Leich manufacturers of telephones, switchboards, and


ON THE FIGHTING FRONT
ON THE HOME FRONT
ON THE PRODUCTION FRONT

ce 1907

OUR BUSIEST YEAR

Hasn't Kept Us From

HELPING YOU!

Assisting Telephone Men Meet the Complex Problems of War-time Operation

The twelve months since last year's telephone convention have been the busiest in Kellogg's history. Together with other manufacturers, we have been supplying the enormous needs of our Armed Forces for communication equipment. For that activity, done in the line of patriotic duty, we deserve no special credit—and ask none.

But what we do want you to know is that, busy as we've been on work for Uncle Sam, we haven't lost sight of our great responsibility to Independent telephone companies. This, in brief, is to help them solve the many new and difficult problems brought about by war-time restrictions.

How ***have*** we helped? How are we helping now—and how will we continue to help?

— By helping you keep existing equipment in shape to meet every demand for dependable service. Kellogg representatives are always ready to discuss your maintenance problems, and to suggest the most practical ways of avoiding repairs and service interruptions through "preventive maintenance" programs.

— By keeping you posted on current priority regulations, and helping you determine your eligibility for essential materials.

— By working closely with you on problems of engineering, financing or installing new telephone equipment for vital-to-war installations.

We are doing these things and others in the knowledge that they benefit not only the Independent industry, but the Nation which vitally depends on efficient civilian communications for Victory.

KELLOGG SWITCHBOARD & SUPPLY CO.

Chicago

Photos by U. S. Army Signal Corps

KELLOGG

Where Engineering and Research Build

Finer Communication Equipment

EXTRA EDITION

Telephon

An Advertisement of Leading Supply Manufacturers Whose Products ...e Distrib

KELLOGG LINE SUPPLIES

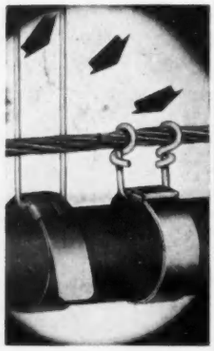
EASY RECOVERY OF ROD MAKES THE EVERSTICK ANCHOR REAL FAVORITE

The combination of rugged strength and simplicity of operation makes Everstick Anchors the choice of telephone men everywhere . . . for efficiency, economy and safety. Eversticks are made of Certified Malleable Iron, for toughness and rust resistant qualities. The patented Everstick Nut Housing locks anchor firmly on the rod, making installation simple under all conditions and permitting easy recovery of the rod. The base plates are specially constructed for extra strength. Use Everstick Anchors and be sure.

ODD.....BUT TRUE !

DEEP SEA DIVERS
TALK BY TELEPHONE WITH EACH OTHER AND WITH THOSE ABOARD SHIP! "EVEREADY" "COLUMBIA" "GRAY LABEL" DRY BATTERIES ARE USED IN THESE UNDER SEA COMMUNICATION SYSTEMS.
86% OF THE TELEPHONE, LIGHT AND POWER COMPANIES IN THE UNITED STATES HAVE ADOPTED COFFING SAFETY PULL HOISTS AS A PART OF THEIR STANDARD EQUIPMENT.
40° BELOW ZERO
AVIATION HEADSETS
MADE IN THE KELLOGG FACTORY ARE TESTED AT 40° BELOW ZERO. AND IT DOESN'T MATTER WHETHER A CENTIGRADE OR FAHRENHEIT THERMOMETER IS USED! BECAUSE 40° BELOW IS THE THE ONE POINT AT WHICH BOTH THERMOMETERS REGISTER THE SAME !

National's Adjust-A-Straps Save Cable Wear Near Pole

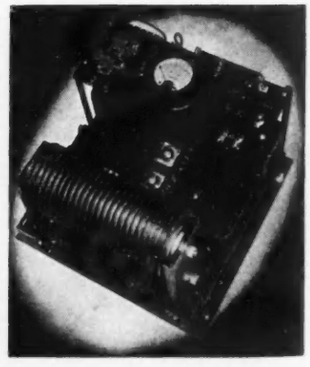


Adjust-A-Straps are designed to be used in place of the two or three rings on either side of the pole. They follow the standard practice of suspending the cable away from the strand, thus eliminating the danger of cable wear that threatens when the cable is in contact with the strand. The broad zinc strap which is tightly wrapped around the cable provides a full hinge motion allowing the necessary play as the cable vibrates, expands or contracts. Split clasp makes them easy to install. Can be used with any size cable ring.

Sharpshooters Are Foiled By Colorless "WT" Glass Insulators

Thanks to their low visibility, Whitall Tatum Glass Insulators are difficult targets for mischievous sharpshooters and rock throwers. The pure, colorless glass is achieved by precision processing of high quality ingredients. The Armstrong Cork Company manufactures all "WT's" to meet A. S. T. M. standards. They are actually stronger than standard steel supporting pins used in tests. They withstand temperature changes more severe than even the toughest service conditions can impose. When you specify "WT" Insulators, you're assured of top-notch, trouble-free performance.

Raytheon RectiChargeR Is Universal Favorite



The Raytheon RectiChargeR is the preferred constant potential battery charger for telephone service. It has been accepted by both large and small companies because of its complete reliability. These users have found the RectiChargeR to be capable of developing maximum battery life, insuring best telephone operation and well suited for operation at unattended locations. Some storage battery manufacturers even increase the life guarantee of their batteries when they know that RectiChargeRs are to be used.

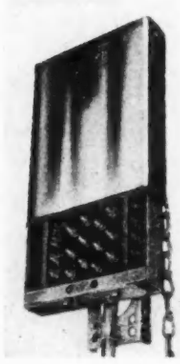
one Facts

EXTRA EDITION

roducts *e Distributed by the Kellogg Switchboard and Supply Company*

INSURE GOOD SERVICE

X-B Cable Terminals Have Many Exclusive Features



For the termination and distribution of lead covered cables the Cook Electric Company's Type S-B Cable Terminal represents a new high in engineering skill, precision manufacture and quality materials. Patented one piece Bakelite face plate and insulating fanning strip; sturdy, non-corroding studs with tinned soldered shoulders; patented cable entrance and holding sleeve for tight cable joint are a few of the exclusive X-B features which make for economy in installation and maintenance and uninterrupted service. Made in 6, 11, 16 and 26 pair sizes.

Ironite Drop-Wire Is Strong and Flexible

Ironite has an honorable service record from World War Number One, and is now once more enabling telephone men to retain service efficiency but at the same time use less material. Ironite Drop Wire . . . Is unusually strong—resists sleet loads on long spans; has high conductivity—Ironite No. 18 BWG is equal to No. 22 B&S copper

in drop wire lengths; has insulation with 10 times required dielectric qualities; is flexible—works and ties easily.

To help you meet rigid budgets in replacements you will find Ironite most reasonably priced.

National Emergency Demands The Best In Experience, Materials and Service

The men behind the Nation's communication lines long ago established a reputation for high efficiency. In every type of weather and business cycle, they have striven mightily to keep the service on a high plane.

Today, with the world at war, no greater responsibility has ever faced the telephone industry. The Armed forces on land, sea, and in the air must have the maximum support of industry, agriculture, and all business to speed Victory. The demand for speed, speed and more speed has its very foundation in adequate, clear and uninterrupted telephone communications.

By placing your requirements in Kellogg's experienced hands, insuring prompt service; by selecting materials and equipment of leading manufacturers, which are fully recommended by Kellogg engineers, you can be sure you are taking the right steps to maintain continuous service.

Kellogg's 50 basic, strategically-located, coast-to-coast warehouses plus a superior organization assures the utmost efficiency in filling your orders.

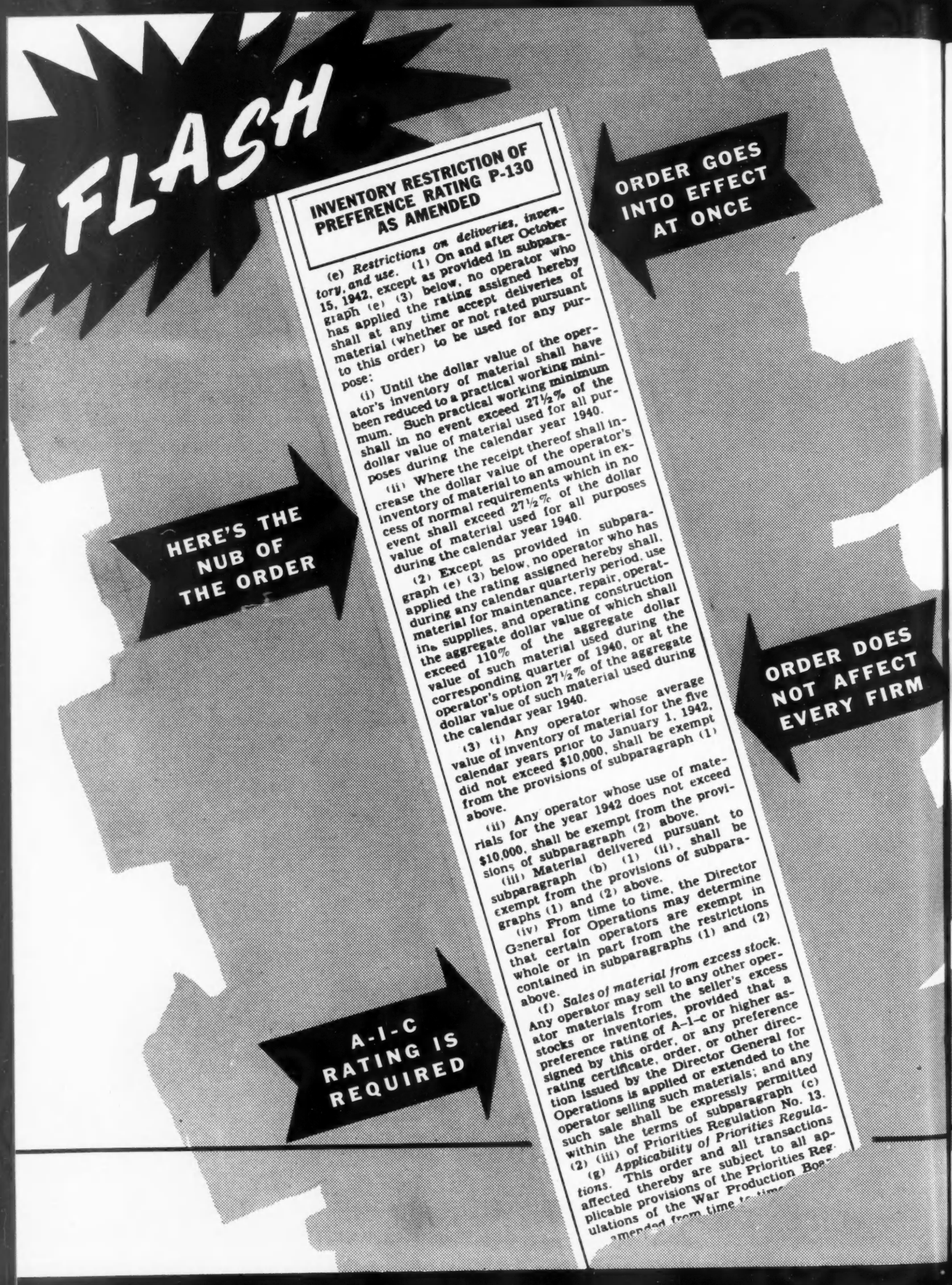
Then, the enviable reputation enjoyed by Kellogg for business integrity is more important than ever now. Telephone men like to know and deal with a company that is ever ready to stand behind the products it furnishes. So every line supply item from Kellogg is *doubly* guaranteed; first by the manufacturer, and then by Kellogg.

LOWER CONSTRUCTION COSTS WITH INDIANA CRAPO HIGH-STRENGTH LINE WIRE

The remarkably high tensile strength of Indiana Steel and Wire Company's new line wire is a real contribution to our war economy. Crapo HTL-85 High-Tensile Low Resistance Line Wire permits as much as 225 foot spans in heavy loading districts. Crapo HTL-135, still stronger, permits 350 foot spans. The saving in maintenance cost on existing lines and construction time on new lines is a vital one these war times, when skilled labor is scarce and all critical materials must be conserved.

Matthew's Telefault Saves Time for "Troubleshooters"

In normal peacetime, time consumed in locating circuit trouble is bad enough, but with vital traffic having to do with our war effort, it's almost disastrous. So the "Woodpecker Telefault" manufactured by W. N. Matthews Corporation is truly a vital instrument today for every telephone company. "Telefault" is a simple device for locating grounds, crosses, split pairs and dead shorts. In fact almost any trouble except "opens" in non-magnetic sheathed cable. Its signal is like a woodpecker on a pole—no confusion with other noises on cable. Extremely sensitive exploring coil assures good results.


FLASH
INVENTORY RESTRICTION OF PREFERENCE RATING P-130 AS AMENDED
ORDER GOES INTO EFFECT AT ONCE
HERE'S THE NUB OF THE ORDER
ORDER DOES NOT AFFECT EVERY FIRM
A-1-C RATING IS REQUIRED
(e) Restrictions on deliveries, inventory, and use. (1) On and after October 15, 1942, except as provided in subparagraph (e) (3) below, no operator who has applied the rating assigned hereby shall at any time accept deliveries of material (whether or not rated pursuant to this order) to be used for any purpose:
(i) Until the dollar value of the operator's inventory of material shall have been reduced to a practical working minimum. Such practical working minimum shall in no event exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940.
(ii) Where the receipt thereof shall increase the dollar value of the operator's inventory of material to an amount in excess of normal requirements which in no event shall exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940.
(2) Except as provided in subparagraph (e) (3) below, no operator who has applied the rating assigned hereby shall, during any calendar quarterly period, use material for maintenance, repair, operating supplies, and operating construction the aggregate dollar value of which shall exceed 110% of the aggregate dollar value of such material used during the corresponding quarter of 1940, or at the operator's option 27½% of the aggregate dollar value of such material used during the calendar year 1940.
(3) (i) Any operator whose average value of inventory of material for the five calendar years prior to January 1, 1942, did not exceed $10,000, shall be exempt from the provisions of subparagraph (1) above.
(ii) Any operator whose use of materials for the year 1942 does not exceed $10,000, shall be exempt from the provisions of subparagraph (2) above.
(iii) Material delivered pursuant to subparagraph (b) (1) (ii), shall be exempt from the provisions of subparagraphs (1) and (2) above.
(iv) From time to time, the Director General for Operations may determine that certain operators are exempt in whole or in part from the restrictions contained in subparagraphs (1) and (2) above.
(f) Sales of material from excess stock. Any operator may sell to any other operator materials from the seller's excess stocks or inventories, provided that a preference rating of A-1-c or higher assigned by this order, or any preference rating certificate, order, or other direction issued by the Director General for Operations is applied or extended to the operator selling such materials; and any such sale shall be expressly permitted within the terms of subparagraph (c) (2) (iii) of Priorities Regulation No. 13.
(g) Applicability of Priorities Regulations. This order and all transactions affected thereby are subject to all applicable provisions of the Priorities Regulations of the War Production Board, as amended from time to time.

Another Problem for Telephone Men

Finds Us Ready With ANOTHER KELLOGG SERVICE

Kellogg Offers Its Services to Help You Reduce Excess Inventories as Required by Government Order

If you are affected by that portion of amended Preference Rating Order P-130 pertaining to restrictions on telephone inventories, you will find the new Kellogg "Inventory Reduction Service" offered here of great help.

This amended order, as you probably know, calls for the reduction of inventories, in certain cases, to what is termed "a practical working minimum" before deliveries of additional materials may be accepted.

This order will find some operating men faced with problems of quickly disposing of one or more kinds of material, for which they have no immediate need, in order to secure other urgently needed material. To help telephone companies dispose of surpluses to other operating companies, Kellogg offers the help of its entire field force and sales offices . . . without charge or obligation.

The plan is simple and workable. It's primarily a matter of bringing buyer and seller together, with Kellogg in an excellent position to know a great many prospective buyers. It can be put into operation at once—just as quickly as you list your surplus merchandise for sale with us. We will immediately make determined efforts to find eligible buyers for those materials. Prospective buyers' names will then be forwarded to you for direct negotiations.

This new Kellogg service is available to give every possible aid to operating companies as well as to co-operate with the War Production Board in saving critical materials. Further information will be sent to you for the asking.

KELLOGG

SWITCHBOARD & SUPPLY CO., CHICAGO

Many executives of the Independent telephone industry are on the merry-go-round this fortnight. The Convention had many of them making last minute preparations on reports; the Wage-Hour Committee was trying to get last minute information on their latest problem with considerable traveling to do; many were in Chicago attending the FCC-NARUC Separation Methods hearing. The newly appointed Telephone Operations Industry Advisory Committee (their pictures are in this issue) were having their first meeting in Washington. We have had a "dither" of our own in getting out our largest Convention Number in history. The radio report of the World Series took the rest of our time!

▼

We note with interest that other chapters of the Independent Pioneers might come into being in the near future. Nebraska and California already have active chapters and we hear that one in Texas is to be formed. Possibly a yearly contest should be added to their activities with a prize given to the "tallest" story told during Convention time in Chicago. We will furnish headquarters at every Convention if you want to start a Pioneer "tall story" contest.

▼

We deeply appreciate the compliment by Mr. Foley reproduced on page 16.

Ray.

TELEPHONE ENGINEER

MANAGEMENT · ENGINEERING · MAINTENANCE

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SERVING THE FIVE BILLION DOLLAR TELEPHONE INDUSTRY

Founded in 1909

Office of Publication, Pontiac, Illinois. Executive and Editorial Offices 7720 Sheridan Road, Chicago, Illinois. Phone Rogers Park 3040. RAY W. SMITH, Editor; ROY F. SMITH, Adv. Manager, DON C. SORENSEN, Sales Prom. Mgr. Subscriptions: U. S., Cuba, Mexico, $1.50 Per Year; Canada, $2.00; In all Other Countries, $3.50. Single copies, U.S.A., 15 cents. All subscriptions should be sent DIRECT to 7720 Sheridan Rd.

Telephone Directories—Old Friends Saving Time and Travel!.....

With the decrease in automobile mileage the telephone directory assumes a still more important place in American family and business life, as the one always available guide to direct people where to buy everything in goods and services—at the same time supplying the proper telephone number to make the necessary call.

Telephone directory advertising is good advertising, and it is more valuable now than ever because telephone directories are being used more today than at any time in the past.

Our organization speeds the work of selling telephone directory advertising, lessens man-hours, cuts waste time, and saves telephone companies money—just the advantages you want today. Are you getting the most out of your telephone directory advertising? Call or write us . . . Perhaps we can point out methods which will result in substantial increased profits or savings for your company in manpower or money.

Telephone directory advertising can best be sold by trained salesmen who do nothing else the year round. Our salesmen have been trained in this one line of selling, with the benefit of the accumulated experience of our organization which was established in 1910 to sell telephone directory advertising exclusively.

Our organization is set up to give your telephone company service during the present emergency, or any other time. If we are not now handling your work and the war has affected the smooth running of your directory department, we are prepared to take over promptly and efficiently handle the publication of your directories and the sale of all advertising and listings. Why not get in touch with us at once?

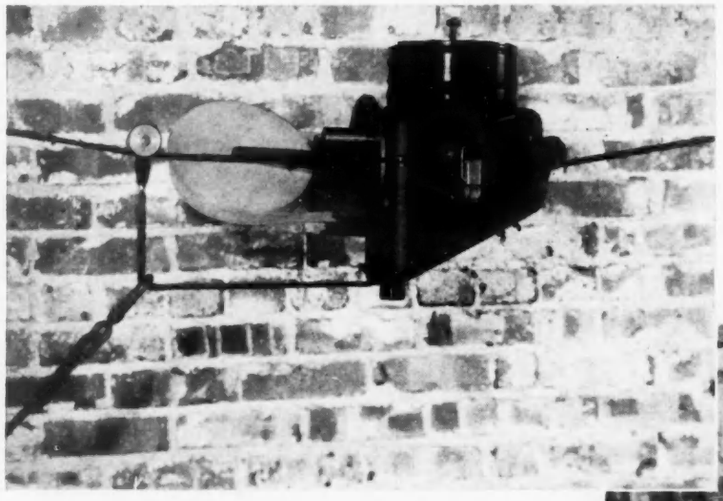
L. M. Berry & Company

DAYTON, OHIO

Serving Telephone Companies in over 3,000 Cities and Towns

Protect your DROPS

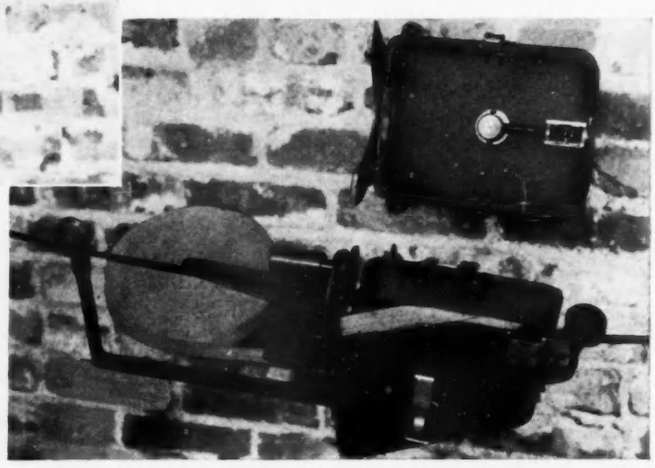
WITH THE "VICTORY" DROP WIRE WRAPPING MACHINE



Recovers and weatherproofs worn Drop Wires without disconnecting the Drop from pole or house.

Spirals one inch muslin tape (with bound edges) under steady tension. Tape is thoroughly protected with insulating paint.

RESULT—A TOUGH, NEW COVERING THAT WILL GREATLY EXTEND THE LIFE OF YOUR DROPS!



Attached at highest point and pulled by hand from the ground. It is simple to operate, and surprisingly clean to handle.

Price **$140.00** f.o.b., Topeka

RENEWS A Worn Drop at a Remarkably LOW COST

The NEW MODEL B SPINNER

REDESIGNED to save critical materials, the new Model "B" has many improvements; New Cable Raising Arm — Detachable Spinner Head to provide a "mechanized" Cable Car for all types of cable servicing. Few pounds lighter—Much stronger.

18 Machines in Use by United States Signal Corp and Coast Guard

For additional information on the "Victory" Drop Wire Wrapping Machine or the new Model B Spinner write your jobber or to

CABLE SPINNING EQUIPMENT COMPANY

432 WEST CRANE STREET, TOPEKA, KANSAS

THIS IS NO TIME FOR "TIME OUT"

KEEP YOUR FWD's ROLLING AND WORKING . . . NO MATTER HOW OLD . . . WITH FWD SERVICE

This is no time to have any trucks standing idle . . . or to make only part-time use of old, worn trucks. Every truck is valuable to the war effort . . . use 'em or recondition 'em to keep 'em rolling! . . . Because extra ruggedness—extra dependability — is built into FWD trucks in keeping with the traditionally sound FWD four-wheel-drive principle, you can gain many added miles of service and complete full-time usefulness from FWD trucks that are veterans of heavy service of ten years or more.

See your FWD branch or dealer . . . ask about FWD's progressive interchangeability of improvements and vital parts . . . find out how worn parts and units, subject to heavy wear and tear, can be progressively replaced with modern equipment and your truck kept in action! . . . Owners of FWD's know that their trucks never become "orphans" . . . that progressive interchangeability of improvements and vital parts keep FWD's in service far beyond the normal expectancy of most trucks.

FWD dealers and branches have signed the Office of Defense Transportation Pledge and are qualified to display this official poster.

Sign the Pledge and qualify to display the Official Emblem of the U. S. Truck Conservation Corps on every one of your trucks. Get your emblem — a decalcomania transfer — from your nearest FWD branch or dealer.

See your FWD branch or dealer . . . they're pledged with the Government's program . . . they are equipped with the facilities, skill, and experience to put new life into even the oldest FWD — no matter how "scarred" with long years of service.

FWD

THE FOUR WHEEL DRIVE AUTO COMPANY • *Clintonville, Wisconsin*

Canadian Factory: KITCHENER, ONTARIO

HAUL LONGER

OR LESS

Announcing the

1943

TELEPHONE "BLUE BOOK"

and

BUYER'S GUIDE

OF MANUFACTURERS AND SUPPLIERS SERVING THE VAST TELEPHONE INDUSTRY

Now being compiled for publication
with the January 15 issue of
TELEPHONE ENGINEER and MANAGEMENT

BUYERS—Keep this issue and use it throughout the year.

★ A complete Directory of telephone equipment with names and addresses of manufacturers and suppliers.

★ Manufacturers and Suppliers are listed 3 ways. Under "Products Classified"; under "Trade Names"; and under "Complete Names and Addresses."

★ Over 7,000 distribution to key factors involved in the design, specification, purchase, installation and operation of all types of equipment and supplies.

WRITE FOR DETAILS REGARDING DISPLAY ADVERTISING IN THIS IMPORTANT ISSUE

TELEPHONE ENGINEER
7720 Sheridan Road Chicago

50 Years of Service

TO THE TELEPHONE INDUSTRY

NORTHERN WHITE CEDAR POLES ARE DISTINGUISHED BY THE GREEN TOP

MAKERS OF NORTHERN WHITE CEDAR POLES

AND

DURAPOLE

WESTERN RED CEDAR

Full Length Machine Shaved
Full Length Creosote Treated Cedar
Continuous Slab Gained
½" Machine Incised Butt Treatment

DURA-ARM

Creosote Treated Wood Cross Arms

ESTABLISHED 1892

THE PIONEERS OF THE CEDAR INDUSTRY

VALENTINE CLARK CORPORATION

ST. PAUL, MINN.

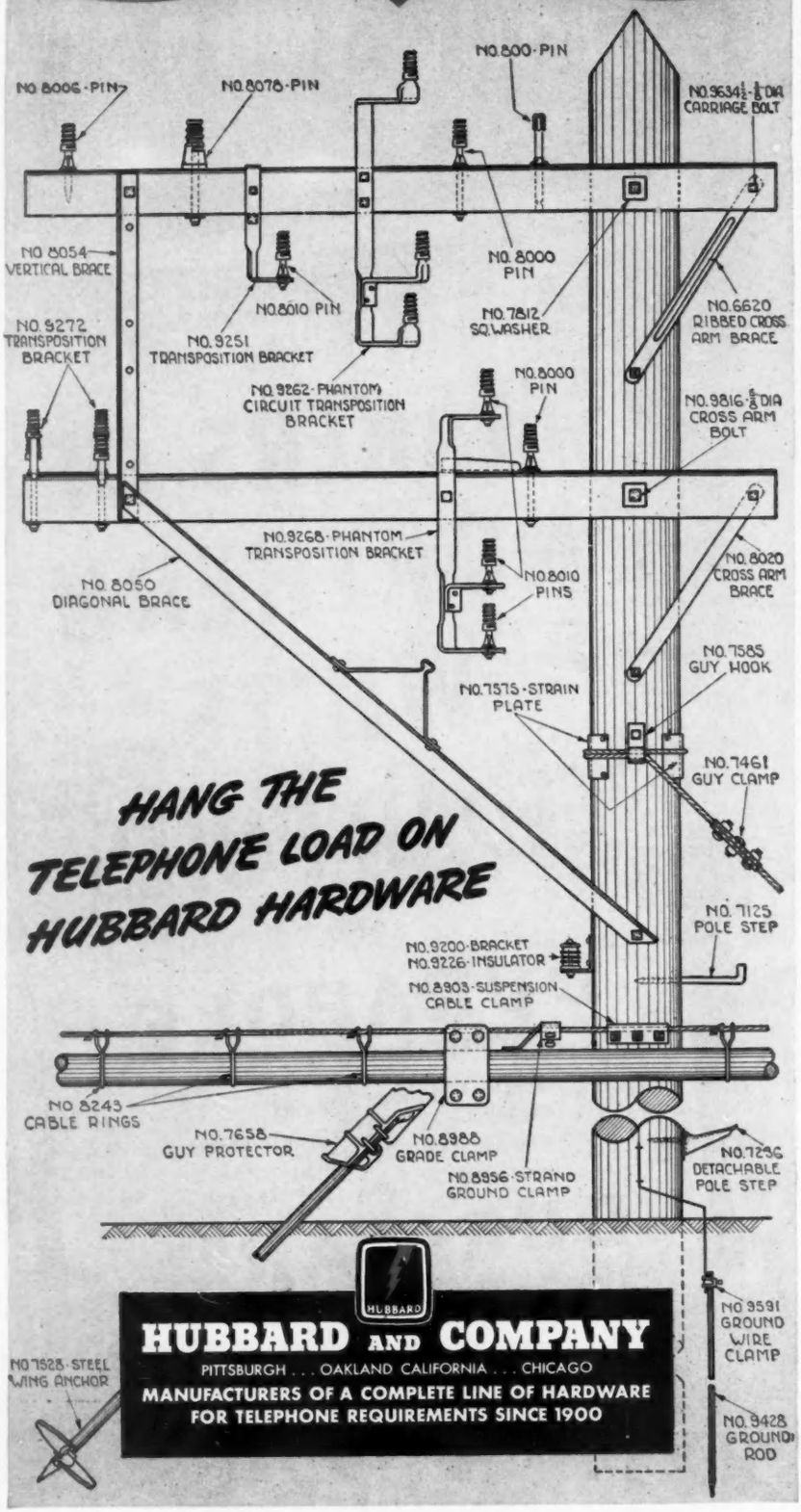
BRANCHES

184 William Street, New York City

YARDS & PLANTS

St. Paul, Minn. Hibbing, Minn.
Newport, Wash. Lumby, B. C.
Roselle, N. J.

FROM ARM TO ANCHOR



HUBBARD

HUBBARD AND COMPANY

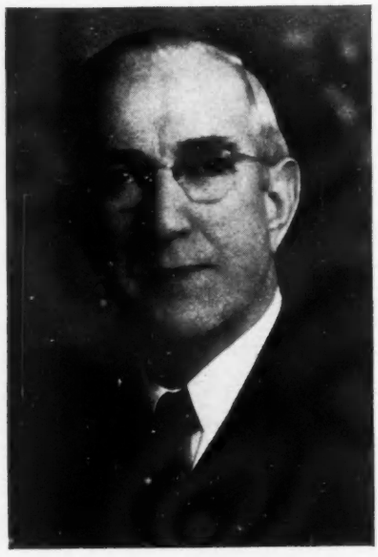
PITTSBURGH . . . OAKLAND CALIFORNIA . . . CHICAGO

MANUFACTURERS OF A COMPLETE LINE OF HARDWARE FOR TELEPHONE REQUIREMENTS SINCE 1900

LETTERS

from TELEPHONE ENGINEER readers

Thank You, Sir!



Theodore V. Halsey

Dear Mr. Smith:

I am under the impression that I subscribed for TELEPHONE ENGINEER soon after it started publication in 1909. While I have been in the telephone industry for over 52 years, 40 with the Pacific Telephone and Telegraph Company and over 12 with the Philippine Islands telephone system, I can't recall any time after 1910 not having your up-to-date magazine for reference.

The Management of TELEPHONE ENGINEER is certainly to be congratulated on the up-to-date and newsy magazine it publishes. It is certainly worthy of our great industry. I hope its success continues for all times in the future.

With kindest personal regards, I remain

Cordially yours,
Theodore V. Halsey
310 University Avenue
Palo Alto, Calif.

◆

Gentlemen:

Enclosed please find check for $1.50 for a yearly subscription to your magazine. In checking up I find that my subscription has expired. In previous years I have received notice from you before it ran out. However, if there has been an increase in price, please notify me, as I would not want to miss having your magazine at any price.

Yours truly,
Albert F. Kilburg
S. 2611 Grand Blvd.
Spokane, Washington

Exide
TELEPHONE BATTERIES

THE more we save, the more we'll have. That's most important today. Wasteful buying, and wasteful misuse of equipment, are *out* for good.

Remember this, when caring for your dependable, long-lived Exide Batteries. Follow the simple rules printed on this page, follow them faithfully . . . and you're really working for America. Take care of your equipment, and help a lot of fighting Yanks take care of the Axis.

YOUR SCRAP will help WIN

AND HERE'S OUR PRESCRIPTION FOR BATTERY CARE!

1. Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
2. Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
3. Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
4. Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 3225.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

CLOSE-UP. When transmission is clear, faithful and free of foreign noises, telephone users can easily forget the distance separating them and somehow feel that they are talking face to face. • By doing its part efficiently and dependably, General Cable Paper Telephone Cable helps to further this illusion.

GENERAL CABLE

Paper Telephone Cables

DISTRIBUTED BY

AMERICAN AUTOMATIC ELECTRIC SALES COMPANY

1033 WEST VAN BUREN STREET • CHICAGO, ILLINOIS

BRANCH WAREHOUSES AT DALLAS, KANSAS CITY, LOS ANGELES, RICHMOND (VA.) AND SAN FRANCISCO

After the War—A Better World

Drop Wire
Bridle
Interior
Tree
Ground
Switchboard
Pothead
Cable Terminal
Instrument
Fixture
Buried Wire

WHEN the clouds of conflict have rolled away, the millions who return to peaceful pursuits will find a better world awaiting them. A world of higher standards of living—and improved ways of doing things.

The new picture will reveal many amazing advances in science and manufacture, developed to meet the urgent requirements of our fighting forces. War's gift to humanity.

Not the least of these gifts will be numerous items of equipment in the Telephone field, based on new processes and synthetic formulas that represent improvements over conventional types.

When Victory is won and restrictions are lifted it will be our pleasure as well as our duty to see that new developments in material and technique are available to the Independent Telephone Industry.

A Name that Commands Respect

ACORN INSULATED WIRE

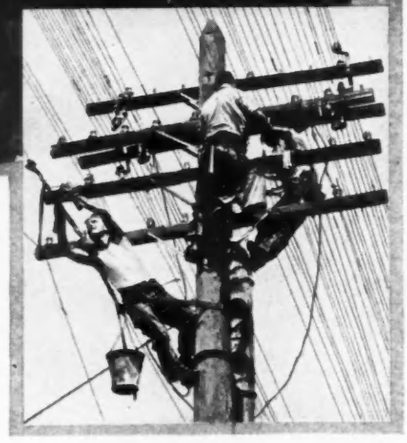
ACORN INSULATED WIRE COMPANY, INC.

LEICH SALES CORP., 225 King Street, Brooklyn, N. Y. LINDSAY SUPPLY CO.,

Crapo HIGH-TENSILE LOW-RESISTANCE LINE WIRE

Service So Vital Must Be Maintained

"Keep the Communication Lines Open!"



SWIFT, uninterrupted communication is vital to success in time of war. Whether it be in the battle zone or on the production front, communication lines MUST be maintained.

• To keep telephone lines at peak efficiency demands constant vigilance and dependable materials. Where open wire circuits are involved, the industry specifies *Crapo* High-Tensile Line Wire—for repairs and replacements, and for essential new, long-span construction. Engineers know that these high-strength wires provide an extra factor of safety, minimize the possibility of breaks, conserve valuable man-hours and materials.

• *Crapo* HTL-85, with 60% greater tensile strength than standard B.B. wire, permits spans to 225 feet in heavy loading, 325 feet in medium loading and 375 feet in light loading districts. *Crapo* HTL-135 has two and one-half times the strength of B.B.; makes possible spans to 350 feet in heavy loading, 450 feet in medium and 500 feet in light loading areas. Both have transmission qualities superior to standard B.B. wire.

• Contact the distributor of *Crapo* Galvanized Products near you or write direct for Bulletins No. 201 and No. 202!

For Long Spans

For Extra Long Spans

Produced by the Manufacturers of *Crapo* Galvanized Steel Strand, Telephone and Telegraph Wire, Construction Wire, Tie Wire, Ground Wire.

INDIANA STEEL & WIRE COMPANY · MUNCIE, INDIANA

P&H PENTA POLES

'42 P&H PENTA

Poles in Immersion Tank after treating solution has been removed.

FULL-LENGTH TREATED NORTHERN WHITE CEDAR

DEPENDABLE SERVICE *at* LOW COST

To the NATURAL advantages of P & H Northern White Cedar Telephone Poles has been added a thoroughly tested and proved protection against sapwood decay and termites. The poles are completely immersed from butt to roof in a highly chlorinated phenol solution many times more toxic than other preservatives in common use.

This highly-developed, laboratory-controlled FULL-LENGTH TREATMENT is low in cost in spite of its amazing effectiveness. It is non-corrosive, non-conductive, pleasing in color. P & H "PENTA" POLES are clean, dry, odorless, light in weight, easy to handle . . . ideal for quick, economical permanent replacement of hazardous old poles *and* for new lines.

ORDER NOW, while cars are available—to help in the war effort as well as to maintain your important line service. Write for full information.

PAGE AND HILL CO.

MINNEAPOLIS, MINNESOTA • 50 CHURCH STREET, NEW YORK, N. Y.

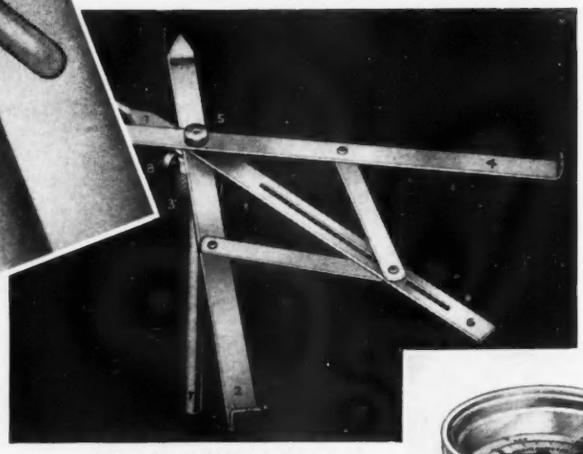
Distributed by AMERICAN AUTOMATIC ELECTRIC SALES CO. • STROMBERG-CARLSON TELEPHONE MFG. CO.

"STILL IN THE LEAD"

DILLON

products

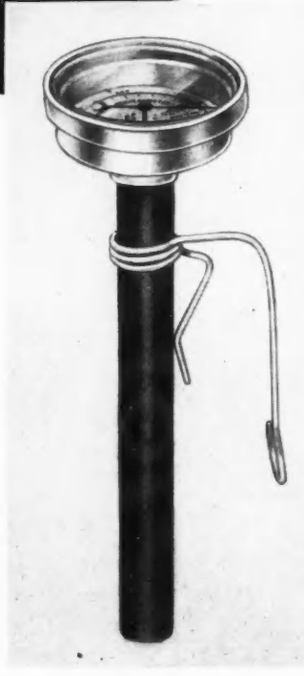
DILLON MODEL "AN" DYNAMOMETER



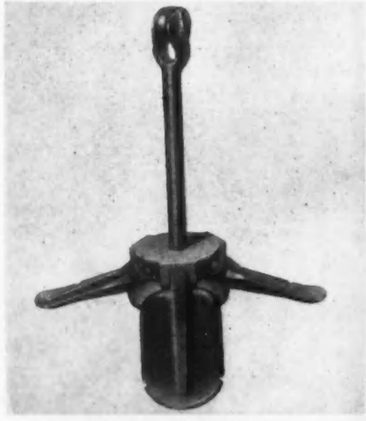
DILLON BISECTOR

KEEP THEM TALKING

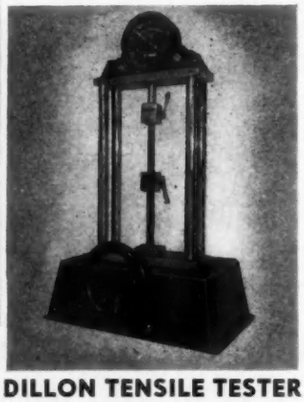
Hundreds of Telephone companies are already feeling the pinch of materials scarcity. Copper and steel wire, guy and messenger strand call for high priorities and must be protected. Construction and maintenance Superintendents are keeping close watch on present leads. Proper tension is being stressed with Dillon Dynamometers. Correct guying is obtained with Dillon Bisector and anchors. Perfect cable joints are made possible with Dillon Temperometers. Truly—Dillon Products offer a degree of line protection that should not be overlooked in these days of material scarcity.



DILLON TEMPEROMETER



DILLON ANCHOR



DILLON TENSILE TESTER

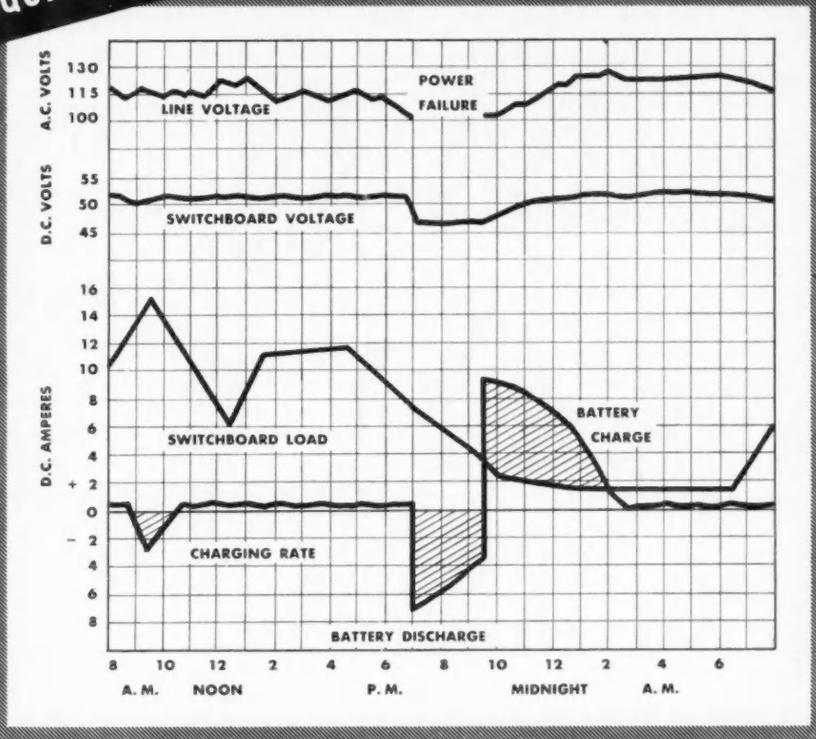
DILLON Company employees are doing their part in helping to win the war for America and her Allies. The Light of Freedom burns staunchly in our shop and laboratories. We aim to keep it burning!

Write For Descriptive Literature

W. C. DILLON & CO., INC.

5410 W. HARRISON ST.
CHICAGO, ILLINOIS

RAYTHEON RECTICHARGER MEETS EVERY REQUIREMENT FOR TELEPHONE DC POWER



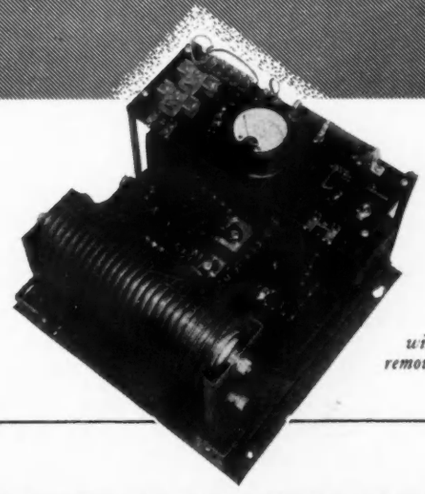
Everyone wants Constant Potential Charging because it insures the best possible telephone operation and because it charges the storage batteries under conditions favorable to maximum life.

The chart shows how the Raytheon RectiChargeR meets every telephone requirement for Constant Potential DC under all operating conditions.

1. NO LOAD
2. VARIABLE LOAD
3. OVERLOAD
4. VARYING AC LINE VOLTAGE
5. AC INTERRUPTION

All of this is accomplished without moving parts and makes the RectiChargeR ideal for unattended operation.

We will be very glad to send you further information or answer any specific questions that you may want to ask.

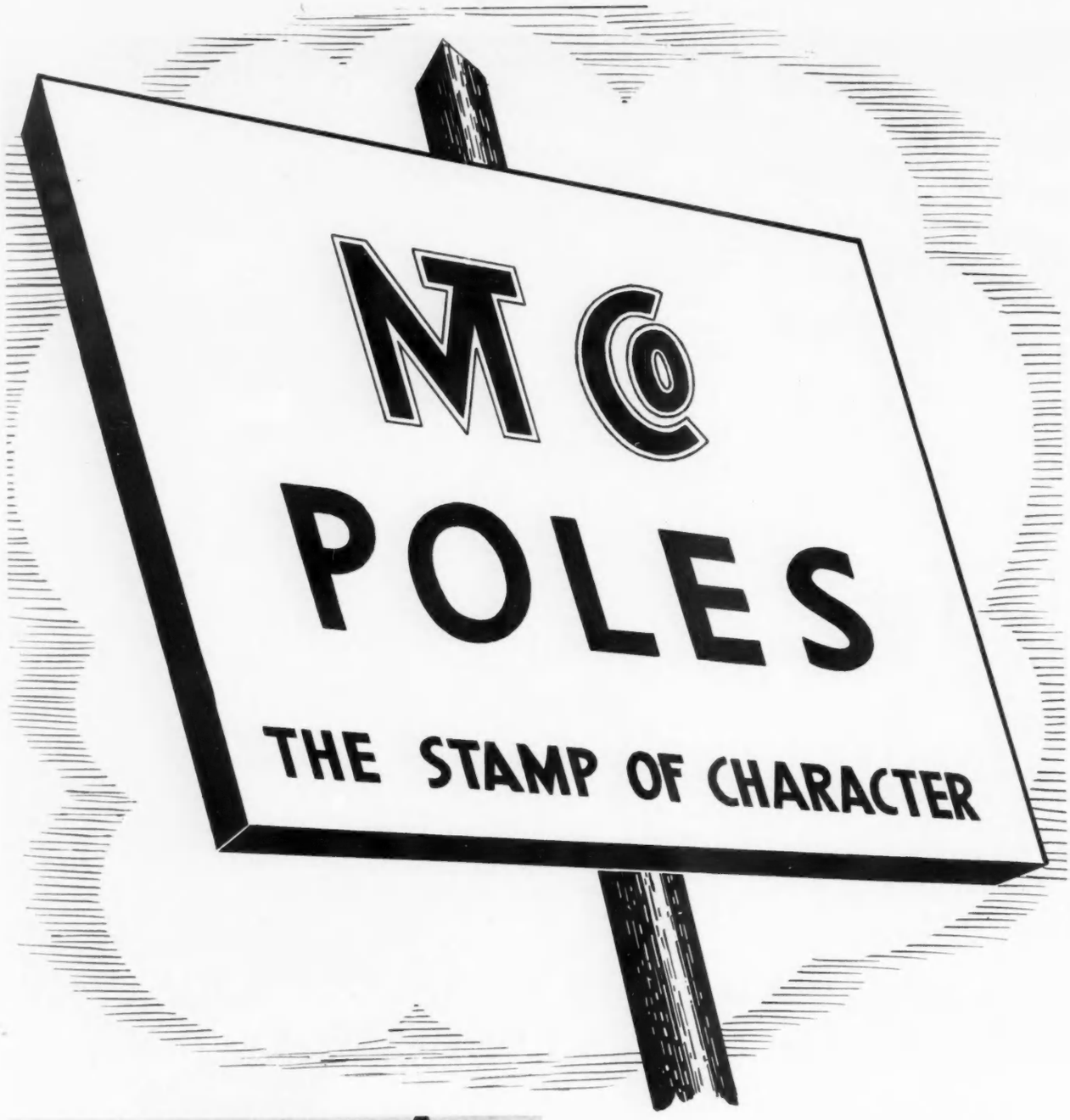


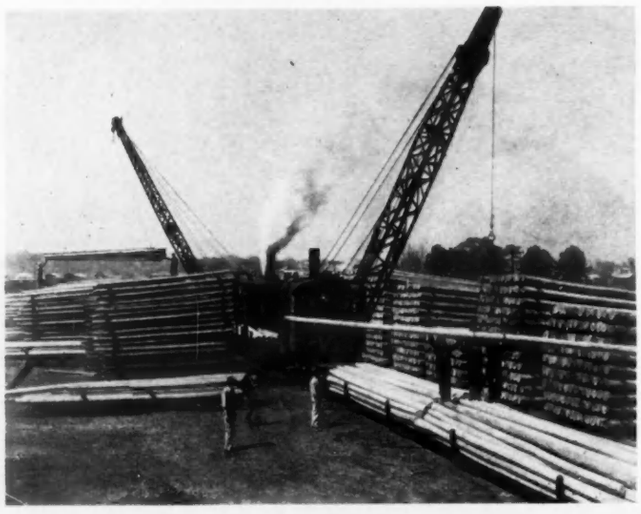
View with cover removed

RAYTHEON

Manufacturing Company

134 Willow Street, Waltham, Massachusetts, U.S.A.





From our large stocks at five strategically located treating plants, we offer you finest quality creosoted Southern Yellow Pine poles for prompt shipments. Your inquiries will receive immediate attention.

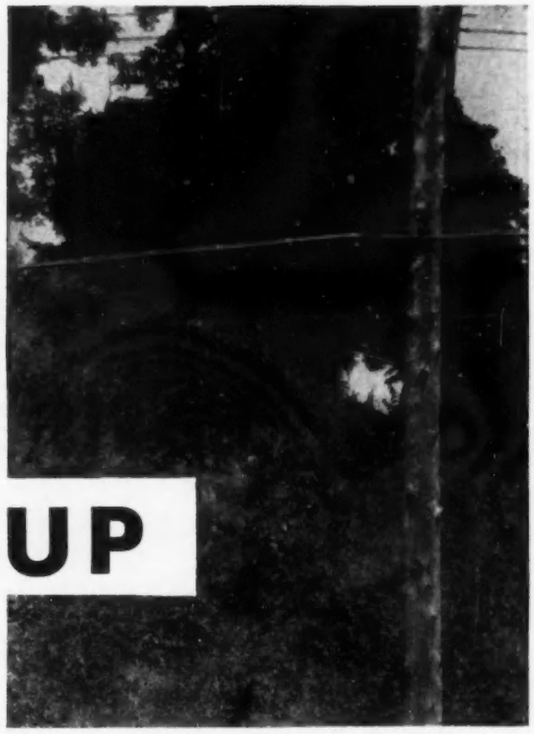
T. J. MOSS TIE CO.

Security Building GArfield 4880 St. Louis, Missouri

PLANTS: EAST ST. LOUIS, ILL.; MT. VERNON, ILL.; GRANVILLE, WIS.; BOSSIER CITY, LA.; COLUMBUS, MISS.

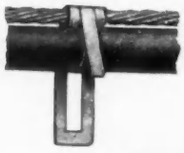
Your CABLES are PRICELESS

Keep 'em.... UP



1.

2.



3.

4.

These four simple steps constitute a complete Reliable Zinc Cable Hanger installation.

Reliable ZINC CABLE HANGERS

— conserve your cables by eliminating sheath cutting, creeping, rusting and early discard. The life of your existing cables (though badly worn) can be measurably prolonged. The cable is securely bound and solidly grounded to the messenger, providing maximum protection from lightning. Re-hang your cables with Reliable Zinc Cable Hangers and minimize your requirements of the materials essential to the WAR EFFORTS—insure your future service—protect your investment and employ your crews in constructive maintenance. Simple to install.

If your cables are not supported by Reliable Zinc Cable Hangers—request specifications, samples and prices.

Reliable ELECTRIC COMPANY

OVER 30 YEARS SERVICE TO THE UTILITIES

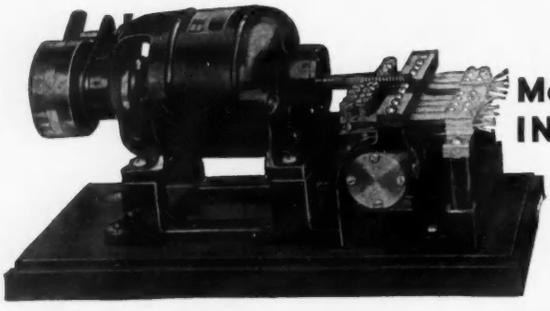
3145 CARROLL AVENUE • CHICAGO ILLINOIS

Let HOLTZER-CABOT *Engineers*
help solve your ringing problems

A complete line of telephone ringing equipment available

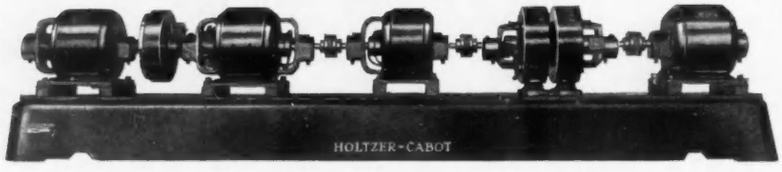
MAGNETO
Ringing Machine

Designed for exchanges up to 1,500 subscribers. Output—80 volts, 19 cycles, 15 watts. Close voltage regulation. Audible Ringing. Low maintenance cost.



Motor - Driven INTERRUPTER

Holtzer-Cabot interrupter equipment will: Eliminate slow acting relays; Reduce maintenance; Give positive timing and is simple and dependable.



Alternating Current Motor - Driven Four Frequency Set

4 FREQUENCY MOTOR GENERATOR

This Machine

has no moving conductors. Requires neither brushes or collector rings. Low cost maintenance. Low current consumption. Output 25 watts. Can be furnished for A.C. or D.C. drive. Can be equipped with tone and machine ringing interrupters.

For complete information, Write

THE HOLTZER-CABOT ELECTRIC CO.

125 Amory St., Boston, Massachusetts **6161 So. State St., Chicago, Ill.**

25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of October, 1917.

TWENTY-FIVE years ago the two telephone exchanges in Foochow, China, serving 530 subscribers, first employed English-speaking operators for the convenience of foreign subscribers. Their telephone fees were $60 Mexican per annum for the ordinary wall instrument and for the desk style, $72 Mexican.

★

From the time when the "first on the ground for the construction of Camp MacArthur" sign of the Texas Telephone Company went up, to the day of its completion, that company did an outstanding job that contributed much to the success of the determination of U. S. Government to build in a night a training camp for soldiers.

★

A "penny apiece" was offered a small boy, Claude Duff, by the Pioneer Telephone Company at Drumright, Ga., for each of their new directories that he delivered. Shortly after noon the boy returned to the office, laid down 62 pennies and an armful of directories, saying that was all the directories he could deliver. It developed that the lad had been charging each of the places to which he delivered a book a penny, and if they refused to pay he would not leave the directory. The company issued a statement that the pennies were in the telephone office and if anyone wanted his penny back they could get it by calling. Those uncalled for were turned over to the little boy. (Big business!)

★

"The most far-reaching influence that will be left on France by this war is that of the American business man and his methods of industry and organization," said Norman Hapgood, American war correspondent in 1917. In a cable dispatch, he related the following story.

"An American officer landed from one of our ships at a certain port in France. He hurried to a post office to telephone to Paris. 'Your number,' said the employee, 'is twenty-three.' 'What do you mean by that?' the officer inquired. 'There are twenty-two ahead of you.' 'How long will it take?' 'They average about ten minutes apiece.'

The officer departed. Five days later there were nine new telephone lines to Paris from that port."

IT'S "BULL-DOG" BUILT!

• Whitney Blake drop wire insulation has *extra* toughness, strength and stamina . . . provides a generous margin of ruggedness against even the *extremes* of wear and weather.

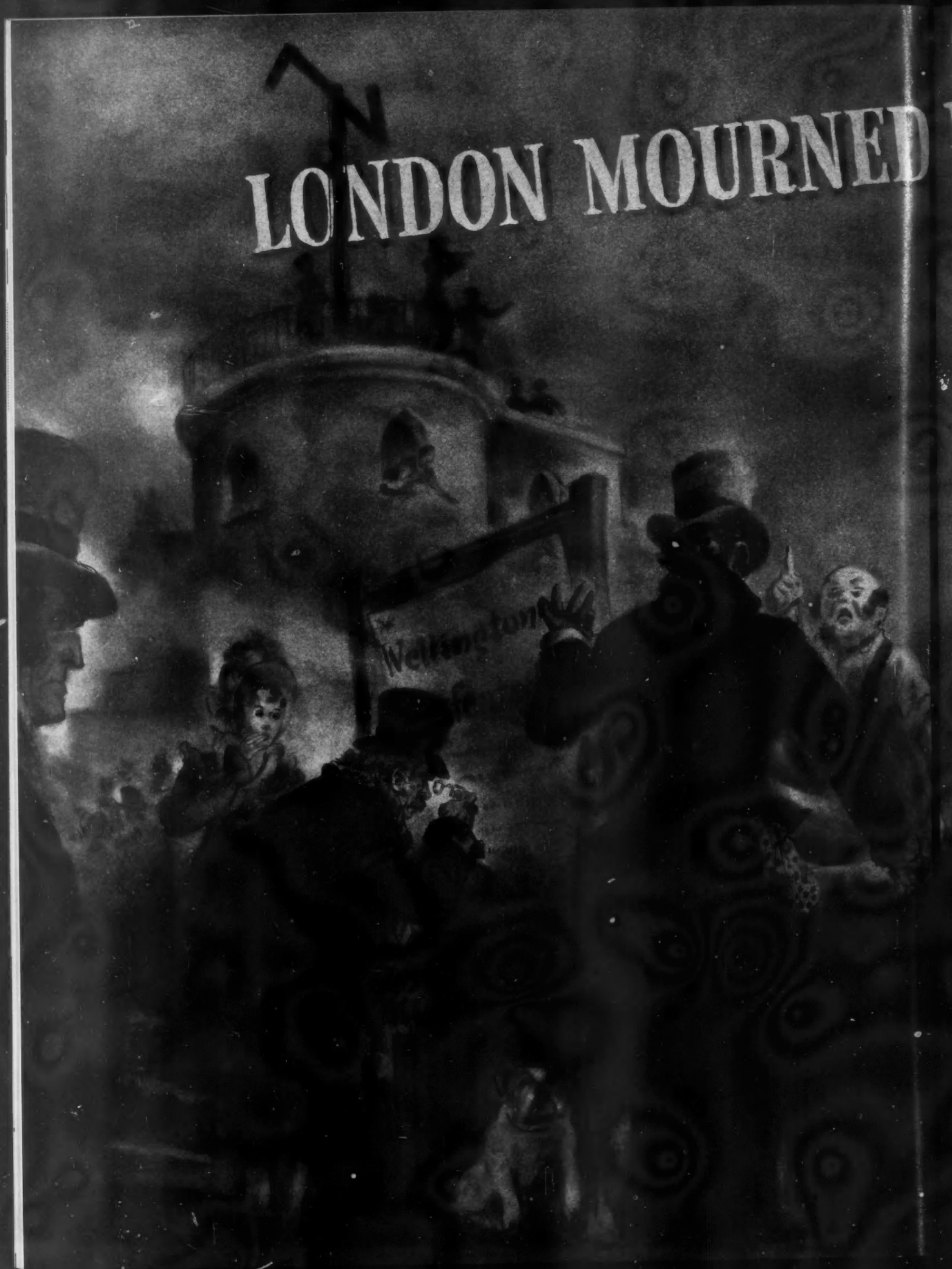
Under normal conditions of use, this margin is assurance of far longer service life, fewer service interruptions and material replacements, fewer demands on the time of your service crews. Now, when it is more important than ever to get these advantages, insist on Whitney Blake drop wire. It costs no more "by the service-year."

★

DROP WIRE . . . DUCT WIRE . . .
INSIDE WIRE . . . TREE WIRE . . .
DISTRIBUTING FRAME WIRE

Distributed by GraybaR ELECTRIC COMPANY

THE WHITNEY BLAKE CO.
New Haven, Conn.
Well Built wires since 1899


LONDON MOURNED W

D WELLINGTON'S DEFEAT!

FOG PREVENTED COMPLETE TRANSMISSION OF SEMAPHORE MESSAGE IN 1812

IN 1812, London, for twenty-four hours, believed what was actually an important victory to be a disastrous defeat.

This was due to the fact that in those days, when Wellington was conducting his peninsular campaign against the French, communications were sent by semaphore. When Plymouth received the word of Wellington's important victory at Salamanca, the semaphore station started a message to London reading, "Wellington Defeated . . . " — at this point, fog stopped the transmission, and London was in distress for twenty-four hours until the rest of the message came reading, ". . . the French at Salamanca."

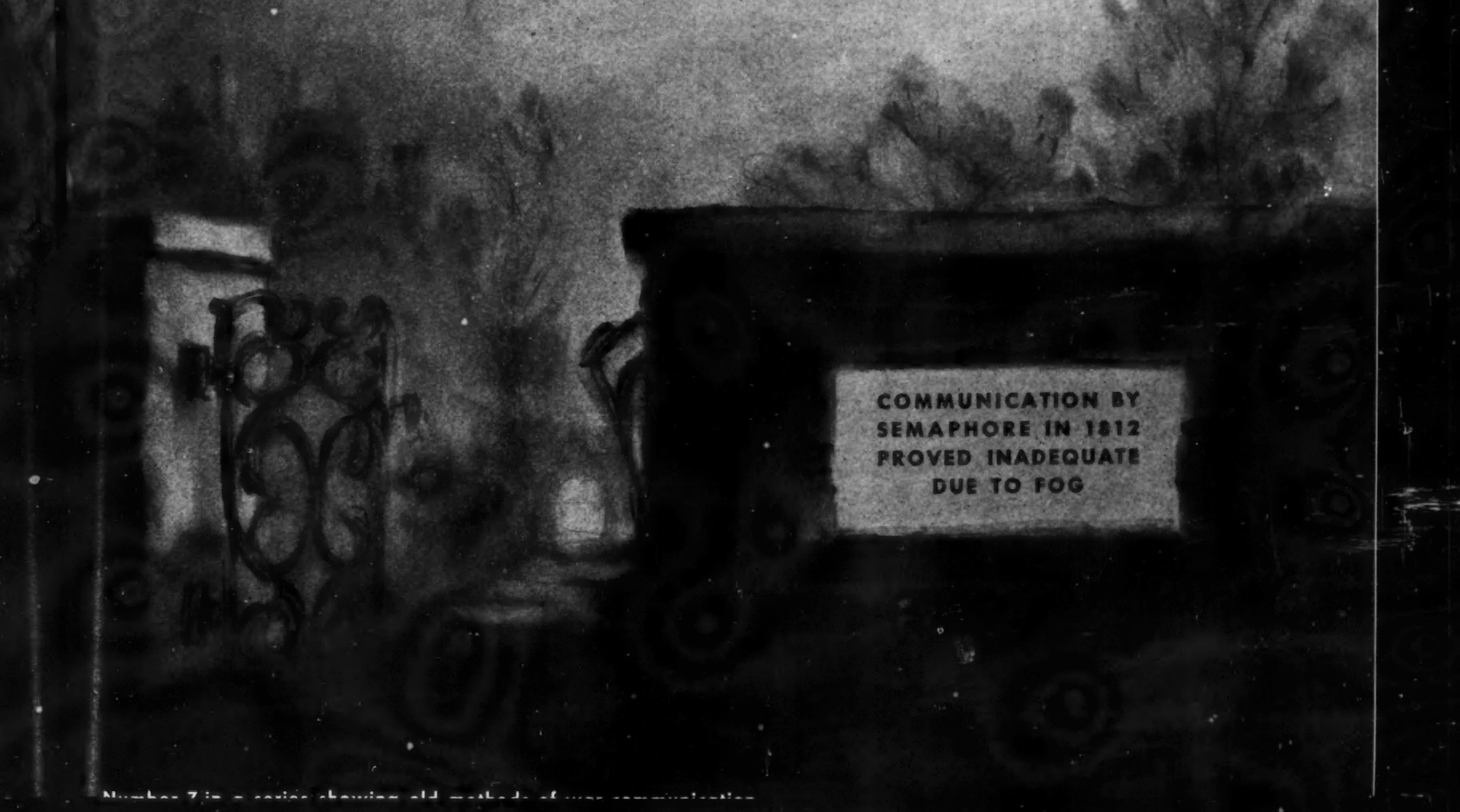
Today, instantaneous communications keep us advised of important military and naval developments. The same type of communications serve to enable generals to give orders to their armies; admirals to give commands to their fleets; aviators to keep in touch with the ground, and the ground with them. Accurate and dependable communications are essential to modern warfare.

Stromberg-Carlson is playing an important part in producing this type of equipment. 48 years spent exclusively in the communications field enabled Stromberg-Carlson to step right into this vital work at the outbreak of hostilities. 168 hours each week, the Stromberg-Carlson factories are humming in their victory effort. Every employee believes it is his foremost duty to *"Help Stromberg-Carlson Help America —There Is Nothing Finer!"*

Stromberg-Carlson Telephone Mfg. Co., Factory and General Offices: 100 Carlson Road, Rochester, N. Y.; Branch Offices: Chicago, Kansas City, San Francisco, Toronto

Stromberg-Carlson

MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR FORTY-EIGHT YEARS



Number 7 in a series showing old methods of war communication

STANDARDS TO GO BY

THIS MASTER GAGE BLOCK provides a basic method of maintaining the accuracy of precision measurement—which is vitally important in the production of all ordnance, munitions and automotive equipment for military use. The steel gage, submitted by a manufacturer, is compared with a National Bureau of Standards primary end standard, made of quartz. Both gages are wrung down on a quartz flat; then light from a mercury lamp causes interference fringes which show any difference in lengths of the blocks, and whether their ends are plane and parallel.

PHOTOGRAPH COURTESY NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.

THIS BATTERY provides a basic unit of power which is regarded as a standard by thousands of telephone men. It is the original telephone cell, developed in the world's largest dry battery laboratory. Because of its long life, sustained voltage and uniformity of performance, it is used by more independent telephone companies than any other brand. Specify "Eveready" "Columbia" "Gray Label" Long Life telephone cells. They are *standard.*

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

UCC

General Offices: New York, N. Y. • *Branches:* Chicago and San Francisco

The words "Eveready," "Columbia" and "Gray Label" are registered trade-marks of National Carbon Company, Inc.

GO BY STANDARDS

EDITORIAL

Our Convention Number

WHEN the United States Independent Telephone Association announced its 46th Annual Convention would be limited to a 2-day streamlined meeting with no frills, exhibits or entertainment . . . and with the government asking that travel be limited, officers of the Association felt that attendance would be smaller than in past years.

We at TELEPHONE ENGINEER immediately saw the necessity of a "Convention in Print" for the many who would be unable to attend the affair . . . yet who were vitally interested in the important matters to be dealt with.

Instead of merely printing our October 15 issue a few days early and giving the telephone industry a glimpse of what was in store for it at the National Convention, we decided to go "whole hog or nothing" . . . go to the Convention on the 15th & 16th, with our camera in hand, an empty notebook and a full determination to snap the notables, get the highlights of the important matters discussed and then . . . rush the pictures to the engraver, burn a little midnight oil preparing our "CONVENTION IN PRINT" copy for the printer . . . and mail the complete Convention Report number to you on the 20th.

The manufacturers and suppliers, who after all make it financially possible for us to render our readers and the industry such a service, thought so well of our "Convention in Print" idea that they cooperated beautifully. Not only did many take extra space but every one of them put in extra hours preparing and sending in their copy earlier than usual. If any bouquets are in order, read the advertisements throughout this Convention issue and thank the men of these companies for their loyal support.

These National conventions have in the past meant we would get to see many of our readers face to face and have the pleasure of getting better acquainted. This streamlined convention has merely cut down our visiting. The ideas we glean for a better magazine for you usually come at Convention time and sitting as we do at the "crossroads" of Independent telephony we feel it our duty to pass on for your edification or enjoyment the things we hear and see.

We hope the world will be at peace and to see everyone of you at the 1943 National Convention.

Official Program

of the 46th Annual Convention

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

HOTEL SHERMAN, CHICAGO, ILLINOIS

OCTOBER 15 & 16

9:00 A. M.—REGISTRATION—Mezzanine Floor, near entrance to Grand Ballroom

Members, Guests, Visitors—Open During Convention.
No Registration Charge.

SERGEANTS AT ARMS

S. A. Lane, Walter Dakin, R. S. Brewster

THURSDAY, OCTOBER 15

9:30 A. M. GENERAL OPENING SESSION
(Grand Ballroom—Mezzanine Floor)
INVOCATION—Reverend George Carlton Story, D. D.
PRESIDENT'S ANNUAL ADDRESS—R. A. Phillips, President
ASSOCIATION ACTIVITIES—Louis Pitcher, Executive Vice-President
APPOINTMENT OF COMMITTEES
FINANCIAL AND MEMBERSHIP REPORT—Chas. C. Deering, Secretary-Treasurer
WASHINGTON ACTIVITIES—Clyde S. Bailey, Vice-President
MISCELLANEOUS BUSINESS
ADJOURNMENT

THURSDAY, OCTOBER 15

1:30 .P M. GENERAL SESSION
(Grand Ballroom—Mezzanine Floor)
ADDRESS: "THE FIGHT FOR AIR POWER"—By Colonel Hugh J. Knerr
WAR PROBLEMS—E. C. Blomeyer, Vice-Chairman, National Defense Committee
Discussion
ANNUAL BUSINESS MEETING—INDEPENDENT PIONEER TELEPHONE ASSOCIATION OF THE UNITED STATES—John H. Agee, President, Presiding

FRIDAY, OCTOBER 16

9:30 A. M. GENERAL SESSION
(Grand Ballroom—Mezzanine Floor)
NEW FEDERAL TAXES—
J. F. O'Connell, Chairman Tax Committee
I. J. Devoe, Chairman, Accounting Committee
Discussion
ELECTION OF DIRECTORS
JOINT REPORT ON TOLL COMPENSATION AND SEPARATION METHODS—
E. M. Blakeslee, Chairman Toll Compensation Committee
Ranford Dunlap, Chairman Separation Methods Committee
Discussion
NEW WAGE-HOUR QUESTIONS—
John H. Agee, Chairman Wage-Hour Committee
Discussion
1:30 P. M. GENERAL SESSION
(Grand Ballroom—Mezzanine Floor)
Address: By Honorable James Lawrence Fly, Chairman Federal Communications Commission Board of War Communications
The Signal Corps and our Affiliated Units—
UNFINISHED BUSINESS
OPEN FORUM
ADJOURNMENT SINE DIE
1:00 P. M. TRAFFIC CONFERENCE—Parlor L, Mezzanine Floor. Mrs. Mayme Workman, Chairman

President-elect John R. Porter, president of the Carolina Tel. & Tel. Co., Tarboro, N. Car. and vice-president Clyde S. Bailey, new Association manager of the USITA.

Alden L. Hart, Abilene, Kan. (left) newly elected USITA director snapped while talking to Pierre Van Valkenburgh of North Electric and Mrs. F. R. McBerty.

Convention Report of The USITA 1942 Meeting

By RAY W. SMITH, Editor

THE United States Independent Telephone Association adjourned their 2-day wartime 46th Annual Convention at Chicago on the afternoon of October 16 to complete what many in attendance claimed was their most successful convention in history. Although the number attending was smaller than those of the past few years, there were possibly more companies represented. The meeting had a wartime keynote however organizational changes shared the limelight.

John R. Porter, president of the Carolina Tel. and Tel. Company, Tarboro, N. Car., was elected president to succeed R. A. Phillips, vice president and general manager of the Central Electric & Telephone Company, Louis Pitcher, executive vice president of the association for the past five years was not a candidate for re-election as organizational changes completed at the convention called for the changing of offices to Washington, D. C. from Chicago. Clyde S. Bailey, vice president of the association, will manage the new association headquarters in Washington. The incumbent vice presidents, Col. Wm. C. Henry, Signal Corps, U. S. Army, and general manager of the Northern Ohio Telephone Company, Bellevue, and John H. Wright, president of the Jamestown (N.Y.) Telephone Co., were re-elected. Chas. C. Deering, Des Moines, Iowa, was re-elected secretary-treasurer.

The only changes in the directorate of the association were the election of P. W. Conrad, president of the Automatic Electric Co., Chicago, as a director and Ray Dalton, vice president and general manager of the West Coast Telephone Co., Everett, Wash., who replaced E. R. Hannibal, deceased; and the election of two new directors called for by the adoption of new by-laws during this convention whereby the directorate was enlarged from thirty-four to thirty-six members. The new directors are: H. V. Bozell, president of the General Telephone Corporation, New York, N. Y., and Alden L. Hart, president of the United Utilities, Inc., Abilene, Kansas.

P. W. Conrad, president of Automatic Electric Company, Chicago, was elected a director of USITA.

The decision to institute organizational changes indicated above resulted from a special committee report to the Executive Committee who requested that a study be made on the advisibility of moving general headquarters of the association to Washington, D. C. This committee advised the moving of the general headquarters since the activities of the association have mainly centered around the nation's capital for the past few years, according to their investigation. It was announced on the floor, however, that the annual meetings would still be held in Chicago due to its central location. In choosing Mr. Bailey as the manager in charge of the Association headquarters the Association chose their vice president that had been in charge of that office for the past two years. He is to have a technical assistant, yet to be named, to assist him in problems of that nature that might be referred to the Association.

HANDSOME gold wrist watches were presented to retiring president Phillips and to retiring executive vice president Pitcher by the Association. As mentioned above, when Mr. Pitcher was notified that headquarters might be moved to Washington he asked that his name not be placed for re-election.

The officers preparing the program received much praise for their efforts on the streamlined 2-day meeting and many remarks were made that the 1942 convention was the "meatiest" ever presented.

When it is remembered that the Association accomplished in two days what in normal times takes four days you get the tenor of the meeting and its results. Prominent men of the industry plus such well known personages as FCC Chairman Fly, WPB Board's Leighton H. Peebles, Bruce H. McCurdy of the telephone section of WPB and Col. Hugh B. Knerr addressed the convention in various capacities. The Independent telephone men voiced their appreciation of these men with much applause as their aid on many matters was given freely and with enthusiasm.

The change in by-laws adopted by the association resulted from a desire to bring these by-laws more up-to-date and provide for a wider extension of activities. The Chairman of the committee to prepare the new by-laws was John R. Porter and they were accepted by the Association by unanimous vote.

In sounding the keynote of the convention in the president's annual address, Mr. Phillips started the program immediately following the Invocation by Rev. George W. Story. In his opening remarks he stressed the importance of the gathering and the necessity for a streamlined time saving program. He said:

"AT OUR association meetings in May we were hardly over the shock of the treachery of our enemies as brought home to us so clearly at Pearl Harbor, but since that time the telephone business, as in the case of all other industry, has found its groove in the routine of—'The war must come first.'

"Even these meetings are a reflection of our attitude in that regard, and we will for the next two days endeavor to crowd all the business of the Association meetings in two days which were usually and have for some time in the past been extended over a four-day period. As announced—it is to be a 'streamlined' conference."

The Fairly brothers are finally pictured together. (Left) C. F., represents Kellogg in California. R. B. heads up the Southwestern Associated at Lubbock, Texas.

Kellogg's advertising manager, Ray Krueger chats with TELEPHONE ENGINEER'S vice-president, Don C. Sorensen.

IN speaking of the broad aspects of our views Mr. Phillips made a plea for unselfish thinking. He said:

"But there are other ways of finding expression for this great question of 'How can I help my Country to win this war?' Probably not the least responsibility is that this group contributes some clear, unselfiish and at times sacrificial thinking. The kind of thinking that will assure the preservation here at home of the very things for which the boys are and will be fighting in all corners of the world.

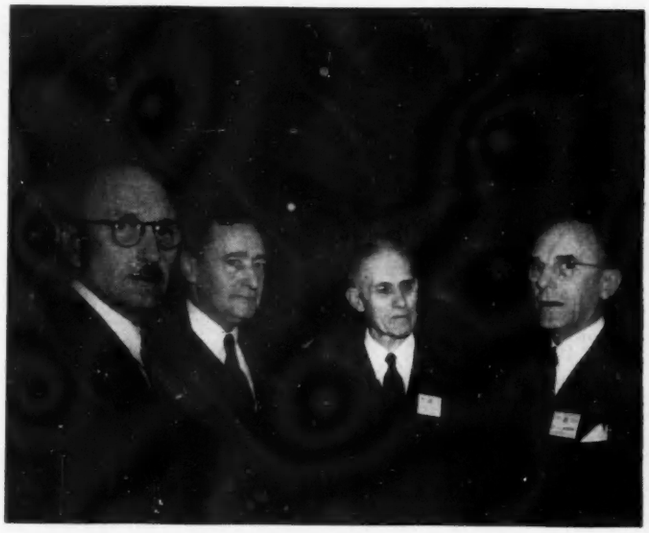
"It will be the kind of thinking that finds a solution to the middle road between two extreme and yet ardent schools of thought. It was not so long ago that many of us were criticizing the particular school that seemed convinced that all social progress started in 1932; that up to that time we had made rapid strides and progress mechanically and scientifically, but that there had been very little improvement in social conditions. Many of us, of course, pointed out that that was entirely overlooking the tremendous changes in the status of employed workmen and work women of our country. We endeavored to show them there was no truth or substance in the statement that 2% of the people owned 80% of the wealth of the country, yet they ardently believed it. We tried to explain an industrial system based on private initiative and incentive was not doomed. Yes, there was and is such an ardent group of thinkers. However, I wonder if their thinking is any more erroneous than that which says that every so-called "new deal" thought or action is fanatical or asinine? While I realize there is a great difference between the intent of certain acts designed to improve social conditions in our country and the actual administration of them, yet I must admit it is indeed difficult for me when remembering farmers in my part of the country blockading highways in farm strikes and actually shooting at each other—in activities dumping milk trucks and all such acts, to then vehemently criticize many recent developments perhaps in many minds carrying the label of the Progressive."

THE retiring executive vice-president Louis Pitcher gave a complete review of Association Activities for the past association year plus outlining present conditions confronting the industry. The Association has been unusually active during this period, entailing much traveling for the various committees and the officers. The national association, under Mr. Pitcher, has made it a policy to attend all of the state association conventions. In our October 1 issue we outlined many of the activities of the association while Mr. Pitcher was its executive vice-president.

Vice-president Clyde S. Bailey reported on the Washington office of the association besides giving the membership the

The busy registration desk on opening day presented a panorama of many familiar faces of telephone operating executives.

Major H. E. Billington, Signal Corps, George R. Folds and J. G. Wray were laughing when we snapped this one.

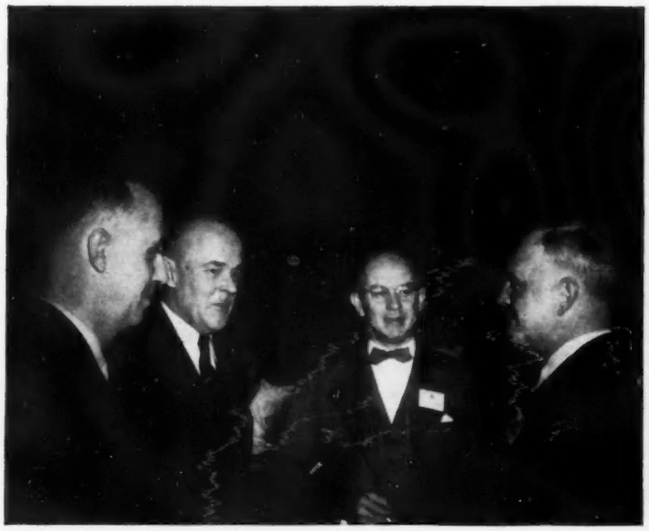


Herb Couch, Topeka, Kansas, Arch Mac-Kinnon, Albany, New York, Sam Tucker, Pleasanton, Kansas are listening while Dr. Ray Manson, Stromberg-Carlson v. p. and general manager, talks.

Forest Clough, H. M. Stewart, Oscar Burton, Colonel William C. Henry and I. J. Devoe insisted on posing and surprised us by doing a good job.

W. S. Cadwell of Leich Electric, H. O. Cauldwell of Roebling Wire and Dan'l H. McNulty of the Telephone Repair Company are busy talking priority problems.

Kellogg's Jim Reese, Reliable Electric's George Morse, J. I. Kennedy, Freeport, and Ray Krueger of Kellogg were interrupted while discussing the second session of the convention.



WPB's Bruce McCurdy, Leighton H. Peebles, and R. A. Lumpkin snapped between sessions while conversing with General Tel. Corp.'s chairman Lacroix.

Kellogg Switchboard's president M. K. McGrath and R. E. Shotts of Columbus, Ohio, attended all sessions of the USITA convention.

E. C. Blomeyer, Chicago, was getting information from WPB's R. A. Lumpkin and L. H. Peebles and failed to look at the birdie for your photographer.

very necessary information on priority matters and other data on government affairs of interest to telephone men. On one important subject we quote:

"Without trespassing upon the domain of the Defense Committee, which later will report on various WPB orders, I would like to stress the importance of just one matter in **your** dealings with the Branch. When you file an application for priority assistance or for relief from the terms of L-50, be careful to state the facts upon which you rely, fully and completely. All too frequently applications meet delays, or rejection, or low ratings, because of insufficiency of basic information.

"While those in the Branch who process your applications are, most of them, practical people with a knowledge of telephone affairs, they cannot be expected to know the details of your local operations. We should not entertain the assumption that they are already familiar with these facts. In the nature of things, they can't be. We should take nothing for granted when preparing our papers."

On wage stabilization Mr. Bailey stated:

"The Price-Wage Stabilization bill, of which that compromise language is a part, was driven through Congress in a hurry by the President's you-do-or-I-will threat. A year ago when the Emergency Price Control Act was being considered, some people in high places refused to include provisions dealing with wages or agricultural prices. Those were the sacred cows at that time. At last year's convention I asked whether any one was so myopic as to believe that wages would be left uncontrolled, in the fight on inflation, if we should witness reverses in battle. We have witnessed reverses in battle. We are now witnessing wage control."

Regarding Manpower and the draft he said:

"I believe that General Hershey recognizes the importance of communications. In several public statements listing activities essential to the prosecution of the war he has included communications and the manufacture of communications equipment in every one. Those statements, sent to the local draft boards, were intended to serve as guides in the classification of draftees. If those statements have not been given the attention they deserve, it is due to the fact that members of the boards have other duties to perform."

"When speaking of an occupational deferment bulletin, we should keep certain facts clearly in mind. One is that such a bulletin covering the telephone industry would not automatically exempt or defer anyone. Under the present law, the Hershey organization is without power to give such dispensation. An occupational deferment bulletin is simply a red flag which National Headquarters puts in front of local draft boards telling them: (1) that the particular industry involved is a key industry, (2) that the occupations listed are critical and a labor shortage in those occupations exisits, and (3) that in classifying or induction, consideration should be given by the local board to these factors.

"When can we expect an occupation deferment for the telephone industry? Almost two months ago the BWC sent labor questionnaires to each telephone company. They are being examined, analyzed, classified. That work will still require a few weeks. Thereafter a report will be made by the WMC. Presumably in due time that agency will get together with the rest of the cooks in order to determine what broth should be brewed. All of these notions take time. The hazard of prophesy is too great for me to undertake, but if I were to resort to conjecture, I would say that a month or six weeks at least may yet be required before any definite, constructive action can be looked for.

"In the meantime, how can you meet a particular draft problem? While under present conditions there is no guaranteed way, here are some steps that can be taken.

1. "If you have a man of draft age, whether with dependents or without, go to your draft board and ask deferment on the ground that he is a key man in a key industry. Tell the board that no one is available to take his place (if that is the fact) and that the element of replaceability is entirely absent. Bear in mind that replaceability, after all, is the key. In making this application, use revised Form 42-A. This is a simplified 2-page document made public on September 26.

2. "Tell the board that General Hershey himself placed communications fourth in listing the seven most essential industries.

3. "Tell the board that in every general memorandum to State Directors in which essential industries have been mentioned, communications have not been left out of a single one. And give the board the numbers and dates of the memoranda.

4. "Give the board the benefit of any

Hunter L. Gary, Emmett Swanson, J. N. Cox and Theodore Gary III posed for a father and son picture.

intimate facts relating to your operations which it should have in order to act intelligently, as well as a description in layman's language of the specific duties performed by the individual concerned in relation to your company's service.

5. "Let the board know what the alternative is in terms of a telephone line of reduced efficiency.

6. "If a draft board should call in your key man, file an application with the War Department as soon as he is inducted asking for his deferment for a sufficient period of time to enable him to train a successor. There is a key personnel section in the Department set up to pass on such applications. Regulations covering this are available.

7. "Do not hestitate to use as much additional paper as may be required to present your case adequately. Likewise do not hestitate to attach as exhibits any supporting affidavit of the military, or the government, or a war-time manufacturer."

THE report of the secretary treasurer Chas. C. Deering showed the association to be in good financial condition after a very successful year.

The first morning session ended after various committees had been appointed and miscellaneous business attended to.

The afternoon program started with one of the featured out-of-the-industry speakers addressing the convention. Colonel Hugh J. Knerr was forced to discard an address he had prepared for delivery in conforming with a telegraphic order from Secretary of War Stimson, forbidding him to discuss publicly the conduct of the war or tactical operations of any branch of the armed forces.

His keynote was unity of purpose, command and objective.

"For 35 years in the army and air force I have been plucking at elbows, telling people that a terrible war was coming. People who pluck elbows are received with impatience, yet that is why I am before you today.

"Many of us have wondered how the 100 years war of 1338 could have been allowed to drag out to such length. Yet we must realize that the present conflict is only the second half of world War I., which began almost 30 years ago, and it is a very different war than we have ever known.

"We must abandon our conception of war as an affair for professional military men. War is big business. We are all in it and we can't pass the buck to the soldiers in this one.

"We have come to believe, too, that democracy can digest any problem thrown at it. Well, it hasn't digested modern war yet. We have choked ourselves on industrial production.

Col. Knerr explained that Stimson's restrictions prevent him from discussing unity of command except in terms of our enemies. The Germans and Japs, he said, have developed unity of command to a high degree. He added that unity in every war has triumphed over bungling "cooperation."

Miss Julia Harmon at the Independent Pioneer's desk is registering conventioneers. W. E. Lawton, Viroqua, Wis. (right) is No. 1 in line.

After his address, the colonel was asked from the floor why there has been no second bombing raid on Tokio.

"The first one was a purely political bombing," said Col. Knerr. "I don't think the necessity for a second one has yet arisen."

E. C. Blomeyer, vice president of Theodore Gary & Co., Chicago, as vice chairman of the Defense Committee made the report for that group. This is one of the most active committees in the USITA and has accomplished much since organized. In discussing committee activities Mr. Blomeyer outlined the various organizations under the Board of War Communications and The War Production Board on which representatives of the USITA were members. He explained this necessity as follows:

"This arrangement is for the very necessary purpose of supplying practical telephone operating knowledge to the many problems that arise in connection with the providing of telephone service under war conditions and in the face of the extreme shortage of many critical materials.

"The Governmental agencies, such as W. P. B. and B. W. C., know of conditions that must be met by the telephone systems in the furtherance of the war. Our business, as telephone people, is to find, or to assist them in finding, ways of meeting these conditions with the least possible disturbance to the telephone systems and service. We think that, generally speaking, this arrangement has been working very well for all concerned.

"The National Defense Committee of your Association acts as a coordinating agency within the Association with respect to defense and war matters. It also deals directly with many of these matters in Washington and elsewhere.

"The Committee has six members. One of the members is connected with the Independent manufacturing industry, which gives the committee and Association the benefit of manufacturing knowledge and advice."

Mr. Blomeyer then gave a resume of the various orders issued to our industry and summarized them as follows:

As the matter now stands, there are three orders now outstanding by W. P. B. that apply specifically and directly to the telephone industry—Conservation Orders L-50 and L-148 and Preference Rating Order P-130. Conservation Order L-41 also applies, as has been stated, to the construction of telephone buildings.

Oscar Burton and Cook Electric's John Jaap interrogating Carl Brorein of Tampa, Florida and Washington, D.C.

Schauer Machine's A. J. Kohn and Automatic Electric's Stratton are caught in a surprise attack by our editor-photographer.

The Minnesota delegation. W. B. Clay (right) has the infectuous smile. G. M. Dwelle is pictured center.

W. C. Dillon, our Don C. Sorensen and Acorn Insulated Wire's Edward S. George were much in evidence during all sessions.

"The recurring changes in and amendments to these orders do not arise simply from the desire of somebody to keep changing things around. This business of dealing with priorities and preference ratings is a comparatively new thing in this country. The business of rationing telephone service is an entirely new thing. Until not much more than a year ago, nobody had any experience to speak of, in this country in such things as priorities and their consequent preference ratings. Until early this year nobody had experience in this country in the general rationing of telephone service.

"Conservation Order L-50 and Preference Rating Order P-130 constitute together sort of a framework for the operation of the telephone industry in wartime. L-50 refers to the things we can or cannot do—with respect particularly to construction or other additions to plant and to the installation of telephones, etc. P-130 refers to the obtaining of material that must be obtained in order to do the things allowed by L-50 to be done.

"To better understand the purpose of and even the philosophy behind these orders, it must be kept in mind that their principal purpose is to reduce the use of scarce and critical materials as much as that can be done in the telephone industry. The scarcity of these critical materials is very real. They are desperately needed for the production of actual armaments—airplanes, tanks, ships, guns, munitions, and so on."

Members of this committee are: John H. Agee, Gustav Hirsch, F. R. McBerty, J. F. O'Connell, R. A. Phillips, chairman, and Mr. Blomeyer.

DURING the afternoon session the Convention was honored by the presence of Leighton H. Peebles, Bruce H. McCurdy and attorney Graham Morrison from Washington offices of the WPB Communications Branch. The Open Forum following the remarks of Mr. Peebles was very worthwhile. Mr. Peebles especially stressed the importance of the Orders L-50 and P-130 and urged the industry to "get tough" if that method would conserve the vital metals we need in war. In fact he stated that the industry would be aiding in our war effort if we would consider "border line" cases under the orders as prohibited that the metals might be diverted to actual war on the fighting fronts. Attorney Graham attempted to answer questions from the floor however he stressed that problems should be sent to Washington with all the facts written out if immediate action is wanted. We advise our readers to follow this advice at all times instead of taking decisions made at the moment.

These gentlemen were roundly applauded by the convention at the end of the session as their remarks and suggestions were timely and co-operative. Their appearance was not noted on the program and members were loud in their praise for their spirit in coming to Chicago to aid them at this time.

The annual meeting of the Independent Pioneer Telephone Association was held as the closing portion of the first day. Elected as president was Gustav Hirsch, Columbus, Ohio, to succeed John H. Agee, Lincoln, Nebr. Mr. J. K. Johnston, perennial secretary-treasurer and affectionately called "Daddy of the Pioneers" gave his report showing a very successful year although the meeting was sobered when the roster of departed members was read. Over 50% more deaths than usual was reported for the association year. Mr. Agee presided at the meeting and paid an unusual compliment to Mr. Johnston for his activities in aiding him during his tenure as president.

Stromberg-Carlson's sales manager L. L. Spencer poses with J. R. Kearney's Nelson Stoker, now in our armed forces.

THE second day of the streamlined meeting started with a report from two committees, the Tax Committee represented by Chairman J. F. O'Connell and the Accounting Committee by I. J. Devoe, auditor of the Lincoln Tel. & Tel. Co., Lincoln, Nebr. The Tax Committee is another committee that has had a very active year. Heard during this portion of the program was Harold V. Bozell, president of the General Telephone Corporation, whose address we hope to reproduce in a coming issue. As Taxes and Accounting are almost synonymous it was natural that the report of Mr. Devoe should be made at the time taxes were under consideration.

Mr. Devoe gave details of the new 1942 tax bill calling attention to the fact that very little or no controversy was being made on that part of the bill having to do with taxes on messages. He also discussed billing methods the new tax bill will make necessary. We reproduce several portions of his report:

"The present law imposes a tax of 5c for each 50c, or fraction thereof, on the charges for each telephone or radio, telephone message or conversation for which the charge is more than 25 cents and which originates within the United States. The proposed law provides for a tax on the amount paid within the United States for each telephone or radio telephone message or conversation for which the toll charge is more than 24c a tax equivalent to 20 per centum of the amount so paid, and provides further that "If a bill is rendered the taxpayer for the services described in this sub-paragraph, the amount upon

A. F. Adams, chairman of the board of Automatic Electric Company (left) greets F. R. McBerty, president of the North Electric Manufacturing Company.

Ohio Association secretary Frank McKinney smiles while we snap Gustav Hirsch, the new Pioneer president. North Electric's Ellis Link is also congratulating him.

which the tax shall be based shall be the sum of all such charges included in the bill, and the tax shall not be based upon the charge for each item, separately, included in the bill."

"The present law provides for a tax equivalent to 10 per centum of the amount paid for leased wire, teletypewriter, or talking circuits. The proposed law imposes a tax of 15 per centum.

"A tax of 6% is provided under the present law on the amount paid by subscribers for local telephone service and for any other telephone service for which a tax is not payable under previous provisions, whereas the proposed law provides for the same services a tax rate of 10 per centum of the amount paid. The present law exempts from tax, all local service paid for by inserting coins in coin-operated telephones and the proposed law confines the exemption to such coin-operated telephones that are available to the public, and further provides that where such service is furnished for a guaranteed amount, the amounts paid under such guarantee plus any fixed monthly or other periodic charge shall be subject to the tax.

"In view of the proposed changes in the law it is obvious that revised billing practices and revised bill forms will be necessary. Toll and telegraph charge tickets will no longer be tax rated individually and should therefore be grouped and totaled in some manner for the application of the tax. The total toll charged on each bill of less than 25c will take the 10% rate and those more than 24c will take the 20% rate. The present collection methods and the number of accounts billed should govern, to a large extent, the methods and form of bill that should be used.

"Companys who follow the rotation plan of billing will in most cases sort toll tickets for one round of billing for the period, in which case the sort will be chronological and divided between toll charges of less than 25c and toll charges exceeding 24c. This billing plan would suggest therefore a toll bill with a single amount column and a tax column. The bill would carry two totals in the amount column for the two foregoing groups of toll charges and a total for telegraph charges, if any, to which would be applied applicable tax rates and extended to the tax column. The total of the amount and tax columns would then represent the total charges to the customer. This same plan might be followed to advantage in any case where billing is done in one round at the close of the billing period.

"In the event that a company has only one billing period and toll billing must be performed daily or at short intervals throughout the month, a multi-column toll bill would be found more appropriate. The multi-column form would permit billing in separate columns the toll charges subject to 10% tax and those subject to 20% tax as well as telegram charge tickets subject to the 15% tax.

"It is recommended that the tax schedule be imprinted on the reverse side of the bill with reference thereto on the face of the bill in order that the customer may be able to understand the tax computation.

"It should be understood that these comments are related to the proposed Revenue Bill with amendments included which were available on October 6, 1942."

The Wisconsin delegation. Joe Byrne, (right) and A. H. Bowden are evidently telling something to their friend.

Discussion from the floor followed the report and many worthwhile questions were propounded and answered.

Election of directors was held at this point of the program. The following directors were re-elected for 3-year terms: F. S. Barnes, Rock Hill, S. Car; A. O. Black, Butler, Penn; J. P. Boylan, Rochester, N. Y.; Oscar Burton, Tyler, Tex; V. E. Chaney, Ft. Wayner, Ind; Harry M. Engh, Erie, Penn; P. M. Ferguson, Mankato, Minn; W. C. Henry, Bellevue, Ohio; C. F. Mason, Santa Monica, Calif; J. F. O'Connell, Madison, Wis., and Leland Wright, Alexandria. These directors are in addition to those mentioned before in this report.

The Toll Compensation Committee, Edwin M. Blakeslee, chairman, and the Separation Methods Committee, Ranford Dunlap, chairman, delivered a Joint Report read by Mr. Blakeslee. In the report on Compensation Mr. Blakeslee gave details of letters, conferences, etc., that have resulted in new schedules being offered many Independent companies by the Associated Bell companies. In summarizing Mr. Blakeslee stated:

"You all are no doubt familiar with the outcome of these negotiations. Many of the Associated Bell Companies have offered new schedules for business interchanged with their connecting companies from and after June 1, 1942, and other companies are known to be preparing to make such offers.

"I presume that you will think that the value of this or any other undertaking is measured by the results obtained. The returns are not in sufficiently at this time to permit us to know the results, but if I may be permitted to make an estimate, it would be my prediction that the Independent companies stand to gain in the neighborhood of $2,300,000 annually as the result of this present program of the Associated Bell Telephone Companies."

ON Separations Methods the speaker referred his listeners to the reports carried in this magazine on the

(Please turn to page 56)

Highlights of the Communications News

Important Communications developments of the past month, briefed for busy readers

by

ROLAND C. DAVIES
Editor, Telecommunications Reports

THE manpower situation now appears to be clarifying in a fashion so that telephone companies can gauge to some degree of accuracy the drains of the war upon their highly skilled employee groups. Foremost is the new draft legislation, drawing youths of 18 and 19 years of age into the Army service which will relieve the strain upon local draft boards that have been forced in recent weeks to dip into the married men without children or single men with dependents in the case of many localities. Second in importance is the current view of the Army leadership to send back to civilian life the older men above 35 or so because they are not adaptable to the rigorous physical demands of modern warfare, which should bring back to telephone companies a number of skilled employees who had previously entered the service.

The most important development for the telephone industry from the standpoint of the draft came in the issuance of a list of "essential" occupations in communications by the Selective Service Headquarters in Washington which were defined as "critical". These included: Cost Accountants; Cable Engineers; Cable Lay-out Man; Cable Splicer; Cable Tester; Maintenance Carpenter; Central Office Installer; Telephone and Telegraph Combination Man; Electrician; Welder Foreman; Instrument Maker; Jackboard Operator; Electric Maintenance Mechanic; Local-Test Deskman; PBX Installer and Repairman; Station Installer and Station Repairman; Telephone Inspector; Telephone Plant Powerman; Telephone Station Installation Supervisor; Telephone-Switchboard Repairman; Teletype Installer and Repairman; Testing and Regulating Man; Toll-Line Repairman; and Wire Chief.

Bruce H. McCurdy, will be presiding officer over Telephone Operations Industry Advisory Committee

Keith S. McHugh, member newly appointed Telephone Operations Industry Advisory Committee

The National Selective Service Headquarters in a guide to local draft boards pointed out that these occupations required six months or more of training. Other occupations in the telephone industry may be added, it was cited by SSS, on the basis of studies by the Board of War Communications and War Manpower Commission which have transmitted complete lists of skilled positions to the Selective Service System. These critical occupations, it was noted by Selective Service, do not mean automatic deferment but the local draft boards were advised to scrutinize any prospective inductee in these occupations from the standpoint of replaceability by the telephone company. It was stressed by Selective Service Headquarters to the draft boards that these "critical" occupations had been certified by the War Manpower Commission as in the telephone industry which is considered essential to the war effort.

At the same time, the War Manpower Commission continued to urge the training of women by telephone companies for all in-plant positions where they can be used. It was cited by WMC authorities that industry must take on an additional 5,000,000 women during the remainder of this year and in the first half of 1943 to replace the men needed for the armed services.

The first move in the direction of rationing of telephone service came during early October in the form of three priorities classifications for long distance calls. The Board of War Communications issued an order **which becomes effective November 1,** for the starting of priorities for war effort long distance calls. This plan was formulated jointly by the telephone companies and the BWC, together with the cooperation of the WPB Communications Branch. It meets all practical needs of the operating telephone industry, it is felt, and contains no defects as far as can be seen. Telephone

E. C. Blomeyer, member newly appointed Telephone Operations Industry Advisory Committee

T. N. Lacy, member newly appointed Telephone Operations Industry Advisory Committee.

toll operators have been trained to handle the priority toll calls during October.

Three priority classifications were established—only the first, which is to be in connection with movements of armed forces, urgent orders to armed forces, war strategy commands and storms or other disasters, can be used to interrupt other toll calls. Telephone operators in connection with this first priority category can break in on a telephone toll conversation, but contrary to press reports the toll operators do NOT listen in on any long distance conversations.

The second priority classification is for calls needing immediate completion for war effort activities, not covered specifically by the cited uses of Priority One. The third priority category is for prompt completion of calls in connection with governmental functions, machinery, materials, etc., for war plants, production of war supplies, maintenance of essential public services, supply or movement of food and civilian defense or public health and safety.

Those eligible to use the priority classifications are: the President; Vice-President; Cabinet Officers; Members of Congress; Army; Navy; Aircraft Warning Service; Federal, State and Municipal Governmental Agencies; Embassies; Legations; United Nations Commissions; Civilian Defense; Red Cross; State and Home Guards; essential war industries, essential services such as communications, transportation, power, water, fuel, press associations, newspapers, and health and sanitation services.

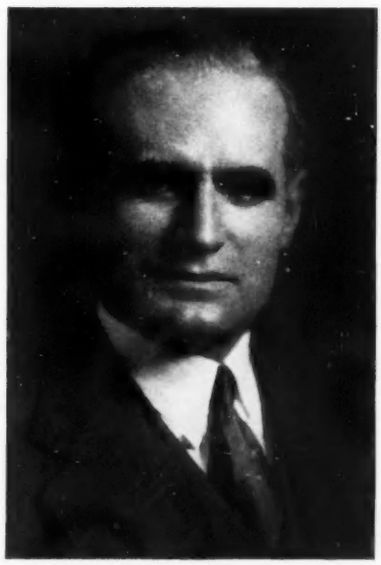
Telephone companies will keep a record of all priority calls for two years after the date of the call. The American Telephone and Telegraph Co., will file each month with the BWC the number of calls having priorities and the number of Class 1 calls which interrupted other conversations for the preceding month, together with the time needed to complete such priority calls. Persons fraudulently or wilfully misusing a priority can have their telephone facilities taken away and be subject to other penalties.

FLASH

On press day of this issue the Selective Service system issued a list of 92 occupations in communications service — including telephone, telegraph, radio and newspapers — which have been certified as activities essential to the war effort. Complete story will appear in our November 1 issue.

New Telephone Operating Industry Advisory Committee Established by WPB

IN THE case of materials and facilities and services, a significant step occurred in the first meeting on October 9th of the new Telephone Operations Industry Advisory Committee, composed of leading executives of the Bell System and Independent industry, to assist the Communications Branch of the War Production Board, headed by Leighton H. Peebles. This Operations Committee will perform advisory functions for the Communications Branch just as has already been accomplished in the telephone manufacturing field by a similar Telephone Equipment Manufacturing Advisory Committee established last summer. Bruce H. McCurdy, Chief of the Communications Branch's Telephone Section, is the Government presiding officer over both committees.



H. V. Bozell, member newly appointed Telephone Operations Industry Advisory Committee and newly elected director of the USITA.

J. H. Agee, member newly appointed Telephone Operations Industry Advisory Committee.

The membership of the Operations Committee is as follows: Bell System: —Keith S. McHugh, vice president of the American Telephone and Telegraph Co.; John Rees, A. T. & T. Engineer; H. S. Dumas, vice president of Southern Bell; T. N. Lacy, vice president and general manager of Michigan Bell; B. T. Miller, general commercial manager of the New England Telephone and Telegraph Co.; and H. H. Nance, A. T. & T. Long Lines Department engineer.

Independent Industry: — John H. Agee, vice president and general manager of the Lincoln, Nebr., Telephone and Telegraph Co.; E. C. Blomeyer, vice president of the Theodore Gary & Co.; John P. Boylan, president of the Rochester, N.Y. Telephone Corp.; Harold V. Bozell, president of the General Telephone Company; Oscar Burton, vice president and general manager of the Gulf States Telephone Co. (Texas); R. A. Phillips, vice president and general manager of the Central Electric & Telephone Co. and retiring USITA president; J. R. Porter, president of the Carolina Telephone and Telegraph Co.; and Lloyd Wright, vice president of the Jamestown, N.Y., Telephone Corp.

At its first session, inventory restrictions, shortages of certain classes of telephone equipment, pooling of apparatus and equipment and the military importance of dual or paralleling toll

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Maj. Gen. Dawson Olmstead Chief Signal Officer of the Army.

Progress of the Signal Corps

By ROLAND C. DAVIES
Editor Telecommunications Reports

WITH communications as one of the all-important and vital requisites of fighting a global war, the Combined Communications Board to aid the United Nations' Combined Chiefs of Staff and the Joint United States Communications Board for the communications coordination of the American Army and Navy, both of which are headed by Major General Dawson Olmstead, Chief Signal Officer of the U. S. Army, have become agencies of paramount usefulness in the planning of the United Nations' military strategy in the fighting on fronts in all parts of the world.

Composed of the leading communications officers of the Signal Corps and Air Forces of the American Army, Naval Communications and the principal United Nations, the Combined Communications Board for the Allied military forces, and the Joint U. S. Board, for the American Army and Navy, have been engaged in the standardization of communications operations and communications equipment through the formulation of overall methods and policies for the fighting fronts and through the evolving of a multitude of unified communications procedures. The tremendous importance of speedy communications for command and military operations purposes has been well recognized by the United Nations' high command, including General George C. Marshall, Chief of Staff of the American Army, and Admiral Ernest J. King, Commander-in-Chief of the United States Fleet.

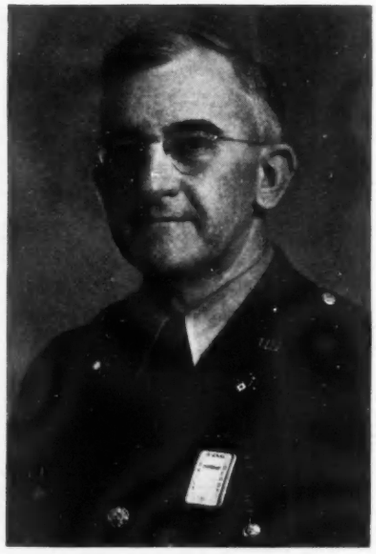
As a result, the demand and necessity for the creation of the two Boards were realized almost directly after Pearl Harbor by General Olmstead and the communications leadership in the Navy, Army Air Forces and the Combined Chiefs of Staffs Command. The two Boards have intensified the scope of their functioning by the establishment of specialized committees to handle problems of all types in military communications covering the entire range of fighting in the air, on the ground and for surface and undersea naval craft. The committees are made up of the outstanding experts in their respective fields of military communications in the Army and Navy and the Allied Nations' forces.

This coordination and advisory functioning on the communications planning and problems of the whole global war now stands out, it is felt, as the major communications development from the military standpoint at the present stage of the war. Contrary to a statement in a recent Washington news letter that the Army and Navy coordination is mainly "surface", it is believed authoritatively that **in communications** at least the Army-Navy coordination is thorough and constructive and functioning most efficiently through the Joint U. S. Communication Board.

Besides this Board's functioning on the policies and procedures of Army-Navy communications, the Navy has an officer with the rank of Captain on full-time duty with the Signal Corps' Military Advisory Board (on which are also communications officers of every combat branch of the Army, the Marine Corps and officers representing the British forces) in the Communication Coordination Division, headed by Col. D. M. Crawford, which surveys and standardizes equipment needs, frequency requirements and operating procedures. The Signal Corps and the Navy also engage in daily cooperation and functioning in equipment procurement through unified groups of production expediting engi-

(Please turn to page 86)

Brig. Gen. James A. Code, Jr.



Maj. Gen. Roger B. Colton

Wire Chief's TRAINING COURSE

Subject: *Cable Splicing-Testing of Quadded Cable*

SECTION XIX

(Prepared Expressly for TELEPHONE ENGINEER by the Lincoln Engineering School)

Quadded Cable

IN ORDER to superimpose phantom circuits on cable pairs, it is necessary that, (except in short lengths) that the pairs of the cable be **quadded** if crosstalk and noise on the phantom and side circuits is to be avoided. Quadded cables are very similar to the non-quadded type except that groups of two pairs are twisted together to form what is known as a **quad.**

The necessity for having two pairs twisted together where phantom circuits are to be carried through cable arises from the same reason that it is necessary to twist the two wires of a pair together in the ordinary non-phantomed circuit to reduce the unbalanced electrostatic coupling to other pairs in the same cable. The twist in a cable pair acts in the same manner as a transposition in an open wire telephone circuit. Inasmuch as a phantom circuit consists essentially of each side circuit (two wires) acting as one wire of the phantom it can be seen that in order to obtain a transposition one pair (side circuit) must be twisted around the other pair (side circuit).

Quadded cables are necessarily somewhat larger in diameter than non-quadded for the same number of pairs because of the greater space factor required by the quads. In some quadded cables a number of non-quadded pairs are carried and these are used for non-phantom circuits which are fed from the same cable.

In addition to twisting the two pairs together to form a quad the cable designer must also arrange for several

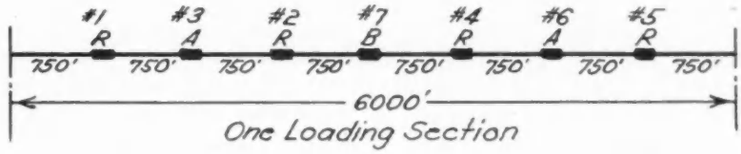


Fig. 1—Sequence of splicing in loading section of quadded cable.

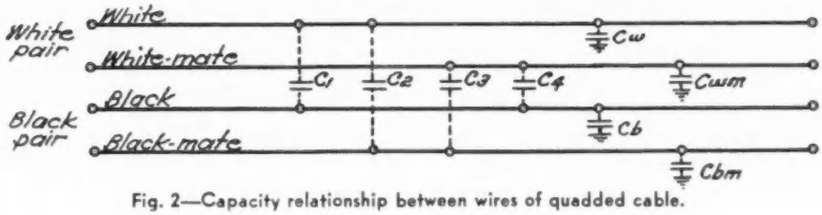


Fig. 2—Capacity relationship between wires of quadded cable.

different **types of quads** so that adjacent quads will be of different types, hence, minimizing the possibility of the twist or transposition of quads which lay adjacent to each other always occurring at the same point, thus nullifying the transposition effect. (Whenever two circuits which parallel each other have transpositions occurring at the same point the effect is the same as if they were untransposed.

This is accomplished by having three types of quads, each type having a different length twist, thus insuring that when quads are side by side the possibility of the twists frequently occurring at the same point is kept to a minimum. If quadded cable is examined, it will be seen that adjacent quads in a layer or between adjacent layers have different colors of insulation which shows they are different.

In general, what is known as type 1 quad (Western Electric Cable), will have one white pair and one blue pair; type 2 quad a red pair and a green pair, and the type 3 a red pair and an orange pair. In some cables there is also a tracer pair which consists of orange and white and this quad is generally found in the center of the cable.

Capacity Unbalance Testing

EVEN though the manufacturer takes every precaution possible in minimizing capacity unbalance, between the wires of a quad and between a quad and other quads of the same cable there will be some unbalance in every section of cable. If quadded cables were connected together by what is termed a **random splice,** that is, without any regard to capacity unbalances in adjacent sections of cable, there might accumulate large overall unbalances in long quadded cable due to the connection of unbalances in adjacent sections of cable in such a manner that they would tend to add together. To avoid this and to reduce the actual capacity unbalances that

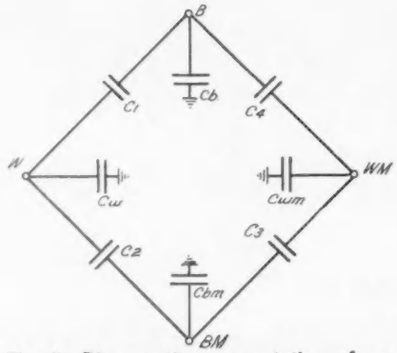


Fig. 3—Diagramatic representation of capacity relationship in quad. (Wires B&BM, and W&WM are the two side circuits of the quad.)

exist in each section to a value as near zero as possible an instrument known as a **capacity unbalance set** is available and which permits measuring the capacity unbalance in adjacent sections of cable so that quads can be spliced together in such a manner that quads of comparable unbalance are connected (poled) so as to oppose or cancel, thus resulting in the nullifying of the unbalance in one section by the unbalance in the next. A splice of this type is referred to as a **capacity unbalance splice.**

Location of Capacity Unbalance Splices

THE number of capacity unbalance splices required in a given length of cable is governed in general by the length of the cable. Usually about four capacity unbalance splices are made in each loading section. On a 6000 foot loading section, there would be a splice approximately every 1500 feet. The additional splices that may be required in connecting adjacent sections or reel lengths of cable are of the random type. That is, no effort has been made to neutralize the capacity unbalance in adjacent sections.

Fig. 1 illustrates how a number of short sections of cable are spliced together in a given loading section. It will be noted that the splices are labeled R, A, and B. The R splices are the random type and should be made first. The A splices are of the capacity unbalance type and should follow the R splices, and the B splice should be made last.

Where the length of quadded cable is short, say one-half mile in length it is desirable to have a capacity unbalance splice near the midpoint so as to improve the overall capacity unbalance characteristics of the cable.

Theory of Capacity Unbalance Tests

AS HAS already been mentioned in order to reduce crosstalk between the two sides of a phantom which is superimposed on the quad, these physical circuits are transposed with respect to each other by means of twists of different lengths. The twist itself is so arranged as to be relatively transposed to other quads that are adjacent to it. Adjacent layers of quads in a quadded cable are also stranded in opposite directions so as to minimize the capacity unbalance between adjacent quads in the layers.

While crosstalk on open wire may be due to either a magnetic or electrostatic coupling, in a cable circuit, due to the fact that the wires of a pair are very close together the mutual induction coupling is very small and plays little part in producing cross talk. We may therefore consider that crosstalk in a quadded cable is due only to the unbalanced capacity between the several wires which make up the quad. Fig. 2 illustrates the capacitances that exist between the several wires of a quad. The capacity between the two wires of a pair and which is generally known as **mutual capacity** is not shown in the diagram as it is of no direct influence on the problem of capacitance unbalance in a quadded cable.

If the capacitance between the wires of pair 1 and pair 2, that is C1, C2, C3, and C4 are all equal, and the capacitance between the wires of pair 1 and ground and the wires of pair 2 and ground are equal, the quad is completely balanced hence, there would be no tendancy for energy to flow from one physical circuit to the other or for an unbalanced flow of current between the physical and the phantom current. But due to the fact that it is physically impossible to get a perfect transposition balance of all the wires in the quad, there is usually some small capacity unbalance, which if not corrected would result in crosstalk either between the two physical circuits or between the physical and phantom and to reduce this unbalance to a minimum, it is necessary to make capacity unbalance tests and then splice the quads together so that the unbalances in adjacent sections of cable cancel out.

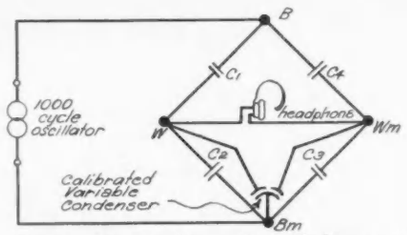


Fig. 4—Circuit of capacity unbalance set arranged for side to side measurements.

Two Types of Unbalance

CONSIDERING the unbalances which exist in a quadded cable, we find there are two types, namely, (1) **phantom to side circuit capacity unbalance** which is the unbalance that exists between either side circuit of a quad and the phantom. (2) **Side circuit to side circuit unbalance.** This represents the unbalance which exists between the two sides circuits of a quad and is comparable to the unbalance which exists between two open wire circuits which parallel each other on a non-phantom or phantomed lead.

For purposes of theoretical discussion the four wires of a quad can be more clearly represented in the form shown in Fig. 3 and the instructions which accompany a capacitance unbalance set of the Western Electric Company give such a diagram in explaining the operation of the set. It will be noted that the two sides of the quad are referred to as the **white pair** and the **black pair** and the two wires as the **white wire** and **white mate** and the **black wire** and **black mate.** The capacitances of wires to cable sheath are shown as Cw, Cwm, Cb, Cbm. The capacities between the four wires are shown as C1, C2, C3, and C4. In order for a quad to be completely balanced the several capacities must equal each other as is shown by the following equation. For example, in connection with the side to side unbalance if C2 plus C4 is equal to C1 plus C3, then the side to side circuit will be balanced and

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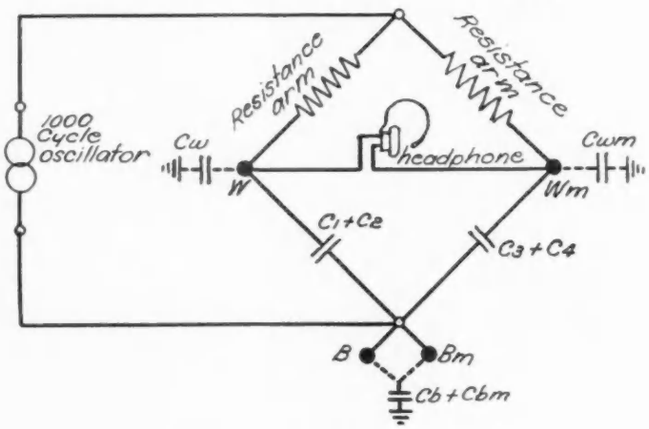


Fig. 5—Circuit of capacity unbalance set arranged for phantom to side measurements.

One of the many applications of Cook telephone equipment is shown here where Army students are using Cook code practice equipment which includes Cook built instructor switchboards.

"WITH TYPICAL AMERICAN EFFICIENCY!"

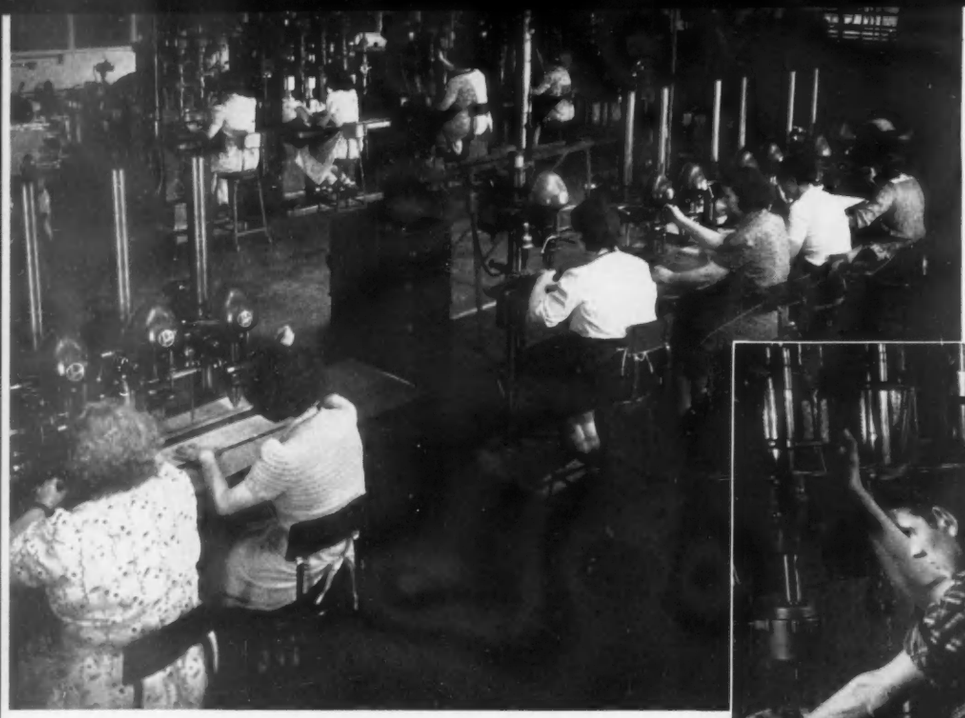
The modern army is only as fast, as flexible, as efficient as its communications systems. In building the greatest army the world has ever known, therefore, American military leaders have had to lean heavily upon the Signal Corps. And that famous branch of service has, with typical American efficiency, built the communications system of the armed forces into a smooth working, quickly handled dependable network.

To do this, the Signal Corps has had to call upon the engineering and manufacturing facilities of the American telephone industry. That included, of course, calling upon the creative engineering and designing skills of the Cook Electric Company of Chicago. With nearly half a century of telephone experience, the Cook organization promptly set about the task of supplying from its products many of the needs of the Signal Corps.

To meet those special needs which war time communications have created, Cook engineers and designers began the creation of a new line of communications products which have included Uniflex Cable Terminals, Cook Terminal Vaults, Cook Pole Jacks and the Terra-Term Underground Cable Distributing Unit. These have been identified in Cook advertising in recent months as being "New for '42." The Trans-Mount System of Protection and Distribution, Central Office Protectors, Distributing Strips, Lightning Arresters, Distributing Frames and Cook's complete line of cable terminals for every communications need are also used in many Signal Corps systems.

Lt. Thomas C. Griffin, hero navigator in the famous Doolittle bombing flight over Tokio and youngest recipient of the Distinguished Service Cross, addresses Cook Electric Company workers commending them for their splendid achievements in the production of aeronautical equipment. Lt. Griffin toured the Cook plant after his talk to see just how Cook craftsmen make their contributions to aeronautical warfare.

Cook engineers and designers and Cook workers are proud of the part their efforts are playing in helping the Signal Corps build the world's finest military communications systems with which to direct the activities of the world's finest army. *(ADV.)*



Views in the Cook Electric Company plant, 2700 Southport Avenue, Chicago, where many of the important machining assembly and testing operations are now performed by women.

THEY'RE PROUD of their jobs and the things they make

Every man in our fighting forces requires fifteen workers to equip and supply him. Helping equip the Signal Corps is the job of Cook Electric Company workers and the men and women who are turning out Cook's contribution to winning the war are fully aware of their great and growing responsibilities.

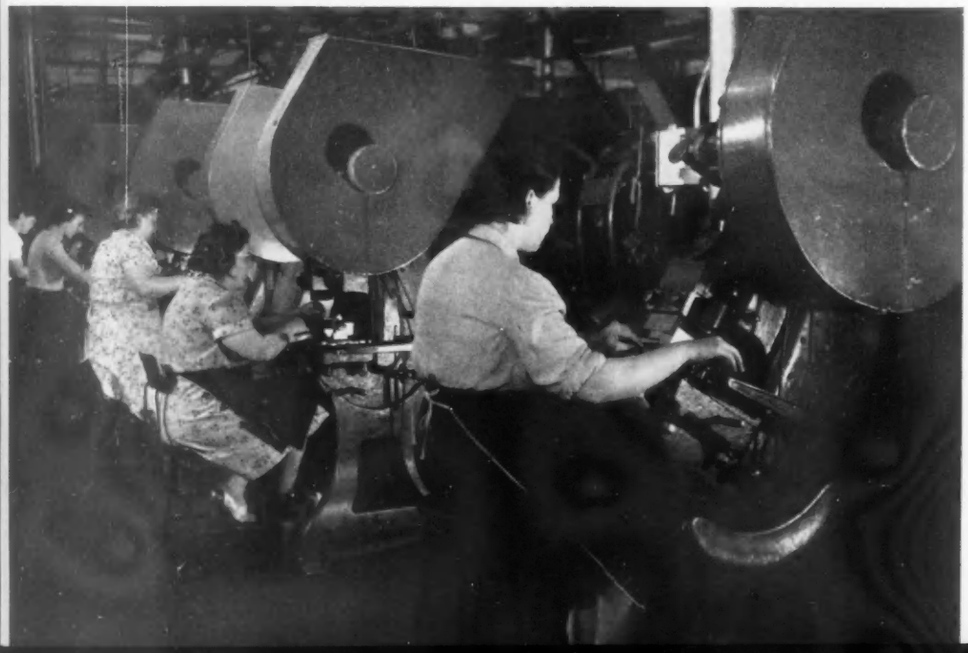
Every Cook worker knows that his job is vital to the United Nations' success. Every worker knows that as Cook production is speeded up quality standards become more critical and the day of victory is brought closer. Prompted by this patriotic urge, therefore, and proud of their company's long standing reputation for excellence, Cook workers are giving a full measure of skill and effort in producing Cook war time precision products and equipment. *(ADV.)*

Alert minds and strong, steady hands are producing death and destruction in a thousand war plants throughout the middle west. Typical of these is Cook Electric Company. Many of Cook's young men have gone to the colors. Their replacement and some of the personnel expansion occasioned by war demands has been accomplished by training women in many of the drilling, punching, lathe and screw machine operations such as are shown on these pages. Above is a view in one section of the Cook plant where women are now doing work formerly done by men.

Plan fifth expansion project

The Cook Electric Company's fifth building expansion project since the beginning of the defense emergency has been announced. The newest activity calls for construction of a new building in which production of aeronautical accessories, ordnance and instruments will be centered. This new plant has been approved by the Navy and as soon as WPB assigns a preference rating building will get under way.

Previous additions to Cook facilities have included a new warehouse, tool room, cable and piece parts warehouse and employment office.



Another view in the Cook Electric Company plant showing a battery of punch presses in the capable hands of women operators. Cook Electric Company's program for training women is but another phase of this company's all out war

A NEW NAME IN AVIATION

American aviation is proving itself more than capable in war and the world will look to American aviation genius for all future air leadership. One of the names which has already won a high place in American war time aviation—a name that is destined to take a great part in helping build America's peace time armadas—is Cook Electric Company.

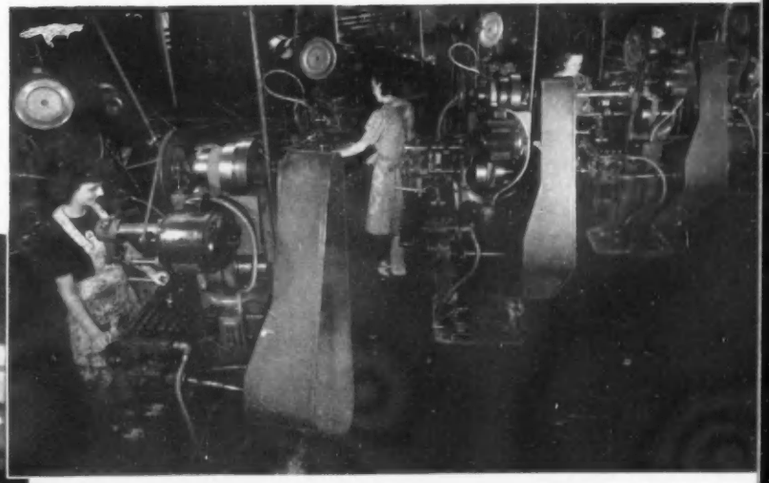
A pioneer in communications protection and distribution, Cook Electric Company was equipped when the call came to meet the demands for the kind of engineering skill and precision manufacturing that is the basis for the production of aeronautical accessories, armament and instruments.

Cook Electric Company continues through the war and will continue after the war to make the finest communications protection and distribution equipment in the world . . . and will continue, after the war, to manufacture many of the intricate parts and aeronautical accessories which are so vital to successful flight. This new activity has led to the establishment through expansion of an aviation division of Cook Electric Company which will utilize a new building soon to be constructed.

Cook Electric Company pays tribute to American aviation and is proud to have a part in waging this war and planning for the great days that lie ahead when a new era in peace time flying will be inaugurated. *(ADV.)*

A view of a section of the Cook Electric Company tool room in the plant at 2700 Southport Avenue, Chicago. Here Cook toolmakers guided by long experience in producing precision equipment for the telephone industry at peace are now engaged in the work of turning out many of the requirements of war.

Keen eyes and exacting test equipment perform Cook's oft repeated inspection operations which are so important in turning out aeronautical equipment from which all chance and guesswork have been eliminated by skillful design, precision manufacturing methods and rigid tests.



A lathe, punch press, a screw machine or milling machine —American women are fast learning to master these tools of war in the Cook plant. They have proven that dexterity coupled with a high degree of concentration make mass production of aviation precision parts possible.

And in Cook's new laboratories these engineers are putting Cook's designs and new products through their paces—"giving them the works"—producing conditions by means of accelerated tests which are far in excess of normal service demands so that Cook products will always measure up to their long standing reputation for excellence.

THE FATE OF A BATTLE HANGS BY A THREAD

A long, peaceful word expresses just about the most vital thing in modern war. The word is *communications*. From headquarters up to the front line may be just one line of thin insulated wire—the sole means of *private* information and orders. The Signal Corps calls it Assault Wire and is using millions upon millions of feet of a very special wire known as Laytex*.

A Mile of U. S. Laytex Assault Wire Weighs Only 29 Pounds

Laytex Wire — fortunately developed and perfected before the war by United States Rubber Company—is so thin and light that one soldier can carry more than a mile of it. But lightness is only one of the assets of this extraordinary wire, which is used not only by our armed forces but in the fire and police communication systems of our cities and in the lighting of modern buildings. Laytex is flexible, strong, tough and—most important in war—will not shatter under concussion. It is practically impervious to moisture and remains stable through a wide range of temperatures. Furthermore, Laytex is perfectly centered because this revolutionary insulation is applied in liquid form. War communications demand the unfailing reliability of Laytex wires and cables.

U.S. Laytex* *REG. U. S. PAT OFF.

ELECTRICAL WIRES AND CABLES

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UNITED STATES RUBBER COMPANY

To help you NOW!

Some timely suggestions to telephone companies for maintaining high service standards during wartime

★

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WAR HAS brought to the telephone industry many s

Because of scarcity of materials, conservation orders, restrictions governing new installations, s —"business as usual" is no longer possible.

Notwithstanding these conditions, telephone companies everywhere are gladly doing all they can have. The suggestions that follow are aimed at helping *your* company "carry on" during wartim and effectively, and as promptly as our available personnel and resources will permit.

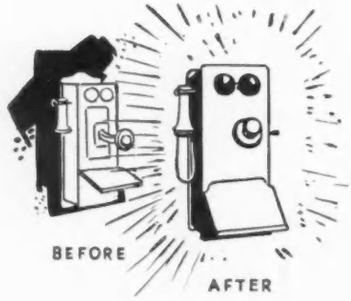
TO MAKE THE MOST OF YOUR PRESENT EQUIPMENT

You naturally want to see that every line and every unit of switching equipment in your exchange does full duty. If shifting traffic has overloaded certain sections, leaving others only partially used, your present equipment may still be rearranged to increase efficiency and improve your service. That is where you can get help from us. Our operating engineers are meeting such situations every day. Why not ask them to help *you?*

TO HELP YOU MAKE YOUR EQUIPMENT LAST LONGER

A sound, orderly maintenance program will help you keep your service standards at highest levels. In wartime, such a program is vital.

The standard routines recommended for your equipment are based on long study and wide experience in keeping such exchanges as yours working at top operating efficiency. If you do not have full instructions regarding the maintenance of your exchange, or if you need help on specific maintenance problems, it will pay you to call on us for advice and help.



TO SAVE MATERIALS THROUGH "REBUILD AND RETURN" SERVICE

Hundreds of companies, small and large, are getting timely value out of Autelco "Rebuild and Return" service, by having their old or worn out apparatus rebuilt to modern standards. It helps companies keep their service standards high, and their maintenance costs low. Best of all it requires little or no critical material.

As new materials become even more scarce, many companies are finding it helpful to repair parts which in normal times would be entirely replaced. The methods we have developed in making such repairs may be of practical and timely help to you. If you have repair problems of this sort, why not place them in our hands?

dustry any serious problems to be shared alike by manufacturers and operating companies. instal ons, shortages of personnel—all the unavoidable result of an all-out wartime economy

ing a ey can to maintain high service standards for their customers with the facilities they duri wartime. We on our part will make every effort to meet your requirements completely mit.

TO HELP SOLVE YOUR OPERATING PROBLEMS

Due to war conditions dislocations of your traffic or service may occur without warning—bringing unusual equipment or operating problems. Such problems may be caused by heavy concentrations of toll or local traffic, by transmission difficulties, by lack of adequate personnel, or by unusual service conditions.

Competent consultation service on such problems is available to you from our operating engineers. We shall be glad to arrange for one of them to call on you whenever you desire such help.

TO HELP TRAIN NEW TECHNICAL PERSONNEL

The armed services are depriving many telephone companies of the experienced personnel necessary to keep their facilities operating at top efficiency. It may be necessary for many companies to institute training programs for new employees.

Whether your requirements in this direction are moderate or extensive, you can depend on us to help you meet them. A wide variety of technical bulletins especially designed for training purposes, is at your disposal.

TO HELP MEET EMERGENCY NEEDS

Despite the utmost care, fire, flood or other disaster may strike without warning, damaging or destroying switching equipment either in your exchange or on a customer's premises. If you are ever faced with such emergency, you will probably be entitled to priority assistance which will enable us to rush temporary equipment for your use until permanent repairs or replacements can be made. We sincerely hope the occasion will never arise, but if it does, call on us.

TO MEET SERVICE NEEDS UNDER CIVILIAN DEFENSE

With total war at our very doorstep, telephone companies the country over are being asked to cooperate with civilian defense officials in planning for adequate telephone service during air raids and blackouts. Your company may need special facilities for air raid alarms, or for the restriction of traffic on non-essential lines during emergencies.

To enable you to take advantage of the latest approved methods, we are prepared to work out suggestions to meet your needs.

THERE IS A SERVICE MAN IN YOUR TERRITORY

No matter where your exchange is located, there is an Automatic Electric field representative available to you on short notice. His prime responsibility is to promote the war effort, and, in doing this to help telephone companies maintain the country's communication channels. His experience and the advice and assistance he is able to render may save you time, trouble and money. Call on him whenever you need his help.

An Invitation . . .

If you plan to attend the Convention, we cordially invite you to visit the factory and offices of Automatic Electric Company during your stay in Chicago. Here you may see first hand some of the things that we are doing to further the war effort as well as to help your company maintain service in these difficult times. Any of our representatives will gladly make all necessary arrangements.

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Conducted by B. C. BURDEN, Technical Editor

Line AND Desk

Transmission and Inductive Interference

Q. In connection with carrier systems reference is made to LOW and HIGH PASS FILTERS, please explain what is meant by these terms.

A. Electrical filters are used to separate the voice and carrier frequencies and also to provide separation between the several carrier frequencies where more than one carrier channel is involved. Filters consist of a network consisting of inductance and capacity elements arranged in various combinations similar to that shown in the following Figure 1-A.

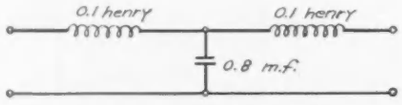

Fig. 1—800 cycle, (500 ohm) low pass filter.

The **Low Pass Filter** is one which will transmit frequencies from zero up to some predetermined frequency with little or no attenuation but which will greatly attenuate frequencies above the critical frequency. The **High Pass Filter** is one which will attenuate frequencies up to some critical frequency but which will offer little or no attenuation for frequencies above this value. There is still a third type of filter that is used extensively in connection with carrier systems, namely, the **Band-Pass Filter.** The band pass filter will attenuate frequencies outside of some given range.

Filter design is somewhat complicated. Filters which are to have sharp cut-off characteristics require great care in their construction. The attached Figure gives actual values for a simple 800 cycle low pass filter, that is, a filter that will pass frequencies up to 800 cycles with little attenuation but will attenuate frequencies above this value.

Q. I have a multi-party rural farm line which is very hard to talk over. Could you give me some idea as to some probable cause of this poor transmission?

A. Poor transmission may be due to anyone or a combination of several factors, namely:

(1) high resistance in line conductor splices
(2) defects in the instrument
(3) high resistance connections at junction poles or at connection of drop wire to line wire
(4) improper adjustment of transmitter or receiver
(5) poor transmission on a multi-party line may also be due to excessive eavesdropping on the part of subscribers themselves.

Eavesdropping by subscribers cuts the received volume at the telephone of the listening subscriber approximately one-half for each eavesdropper.

Q. What is the best test for dry cells to determine if they need replacement?

A. A dry cell when discharged at a current rate of 140 milliamperes and which shows less than 0.93 volts reading per cell is ready for replacement. It is possible that due to the desirability of getting maximum life out of existing material and apparatus that dry cells should be kept in service until their voltage has dropped as low as 0.75 volts per cell (on a 140 M. A. discharge) during the period of emergency that now exists. In this connection, it would seem that telephone companies could save both gasoline and rubber by working out some arrangement whereby replacement dry cells for farm telephones could be picked up by the farmer at the telephone office on one of their regular trips to town. Most farmers are capable of changing the dry cells in their telephones.

Send your questions for free answers on this page.

Pole Line and Open Wire Construction

Q. What is the breaking load in pounds of the several pole classes of the numerical system?

A. The breaking load in pounds, which incidently is the same regardless of pole heighth for pole classes 1 to 7 is shown below. It should be noted **of the secondary rack or to the power** 25 foot line a 30, 40, and 50.

Pole Class	Breaking Load (Pounds)
1	4,500
2	3,700
3	3,000
4	2,400
5	1,900
6	1,500
7	1,200

Q. Rules dealing with power telephone line construction where two pull lines are involved refer to the term structural conflict. Explain the meaning of this term.

A. This refers to the situation where the over turning of the line at the higher level which is usually the power line could result in a contact with the line at the lower level which is usually the telephone line. (See Fig. 1-C).

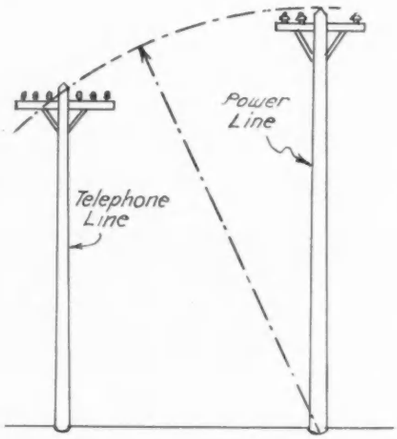

Fig. 1—C-Structural conflict.

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"Get the message through!" is the tradition of men in the Signal Corps. More than 5,500 of them are from the Bell System.

OUT of peace-time telephone making come war-time telephones like these. On every front, they keep the armed forces in contact.

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Western Electric

ARSENAL OF COMMUNICATIONS

V. E. Chaney, Fort Wayne and John Sidlo, Cambridge, Ohio were our victims with the flashlight.

CONVENTION REPORT

(Continued from page 39)

hearings of the FCC-NARUC joint committee held in Chicago during August and early October. Members of this committee attended these meetings and will now study and analyze the evidence and exhibits introduced at the hearings and will submit recommendations. It was explained that briefs are acceptable to the FCC until Dec. 8, 1942. The main question of the hearings was for the determination of the methods to be used in making toll costs separations as distinguished between board-to-board and station to station. The speaker summarized as follows:

"I need not dwell at length on the hearings before the Commission except to say that Mr. E. F. McNaughton, Director of the Public Utilities Department of the California Railroad Commission, and Chairman of the F.C.C - N.A.R.U.C. joint committee, strongly recommended the adoption of the station-to-station theory of making toll separations and endorsed the methods set out in the joint committee's report for use in making such separations.

"The staff member report of August 22 entitled "Distribution of Common Costs of Communication" which has come to be known as the Toeppen report received such criticism under cross examination and had such limited support that it does not appear to warrant further comments at this time.

"Those of us who sat through the hearings conferred frequently as to what action the Association might or should take in the light of developments as they progressed, and at each such conference held to the conclusion that we should not make any formal statement in the record, but that at the conclusion of the hearings the Association or individual companies might, as it or they see fit, file a brief or briefs. I am able to say to you that at the conclusion of the hearing the Chairman stated that all parties of record would be given until December 8, 1942, to file proposed findings of fact, conclusions, and briefs in support thereof."

Chairman of the Wage-Hour Committee Agee also reported at this session. He outlined a new question as follows,

"So far as rulings of the Wage-Hour Division is concerned we have had only one recently which apparently needs some of our attention.

"In July—Mr. C. J. Denicke, Acting Supervising Director of the Division issued a memorandum covering the question whether the conversion of a manual exchange to unattended dial service with toll, complaint and information service provided from an adjacent exchange actually resulted the same as consolidating exchanges.

"The situation arose in Georgia—At Jackson, Ga., a manual exchange with 325 stations was converted to dial. Its toll calls and service calls where terminated at McDonough, Ga. a manual exchange with 250 stations.

"Inspector Denicke ruled that the dial stations at Jackson should be added to the stations at McDonough thus calling McDonough an exchange with more than 250 stations.

"Inspector Denicke ruled that the dial stations at Jackson should be added to the stations at McDonough thus calling McDonough an exchange with more than 500 stations.

"This ruling if carried to a logical conclusion might actually vitiate and set aside the exemption of operators in most of our small exchanges which today pass their toll calls to a toll center. In many small exchanges, the trouble and service complaints are likewise passed to a larger exchange.

"Under this ruling a small exchange need not be converted to an unattended dial exchange to eliminate its classification as an exchange.

Frank Bohn, Fort Wayne, Ind., Ben Sweitzer, Owosso, Mich., Stromberg-Carlson's H. T. McCaig and Roscoe D. Pontius, Rochester, Ind., proved good subjects to a bad photographer.

R. C. Ross, Portsmouth, Ohio, K. L. Schroeder, Cadiz, Ohio and T. A. Saunders of Clinton, Ill. are a handsome trio that attended all sessions of the convention.

"If an agency or contract office received its toll service and reported its trouble to an adjacent exchange its stations would be counted with the adjacent exchange and the operators in both exchanges, even though neither one had 500 stations attached directly to its board, would become fully subject to the provisions of the Wage-Hour Act."

Mr. Agee then explained that he had immediately tried to contact the Wage-Hour Administrator Walling for a discussion on this subject. He went to New York with the following results in Mr. Agee's words:

"We discussed the Georgia ruling for more than an hour and while he was unwilling to commit himself without consulting his legal department he stated that he was inclined to agree with my arguments if his lawyers would likewise agree.

"He promised to write me of his decision within the next couple of weeks. In the event that the decision is not favorable we agreed upon an informal hearing in Washington November tenth.

"We have received some twenty letters from member companies stating the probable effect on their operations if the Georgia ruling stands. These all considered the matter from the results which might follow in cases of unattended dial exchanges only, but my opinion, as stated before, is that the ruling would surely extend to small manually operated exchanges where toll calls are passed to a toll operator at an adjacent exchange."

In his closing remarks Mr. Agee said:

"I should remind you however that the 40c minimum will apply in 1945, and every telephone company should be ready for it. In spite of the latest control over wages and prices and the law prohibiting rate increase without notice to the President it is my opinion that if your state commission finds that increased wages require increased rates that you may properly apply for them and the request should not be denied."

FCC Chairman James L. Fly was the principal speaker on the closing afternoon session. He said that he expected the new system of long distance priorities

(Please turn to page 67)

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EXTRACT FROM PREFERENCE RATING ORDER P-130
(As amended September 8, 1942)

(e) *Restrictions on deliveries, inventory, and use.* (1) On and after October 15, 1942, except as provided in subparagraph (e) (3) below, no operator who has applied the rating assigned hereby shall at any time accept deliveries of material (whether or not rated pursuant to this order) to be used for any purpose:

(i) Until the dollar value of the operator's inventory of material shall have been reduced to a practical working minimum. Such practical working minimum shall in no event exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940.

(ii) Where the receipt thereof shall increase the dollar value of the operator's inventory of material to an amount in excess of normal requirements which in no event shall exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940.

(2) Except as provided in subparagraph (e) (3) below, no operator who has applied the rating assigned hereby shall, during any calendar quarterly period, use material for maintenance, repair, operating supplies, and operating construction the aggregate dollar value of which shall exceed 110% of the aggregate dollar value of such material used during the corresponding quarter of 1940, or at the operator's option 27½% of the aggregate dollar value of such material used during the calendar year 1940.

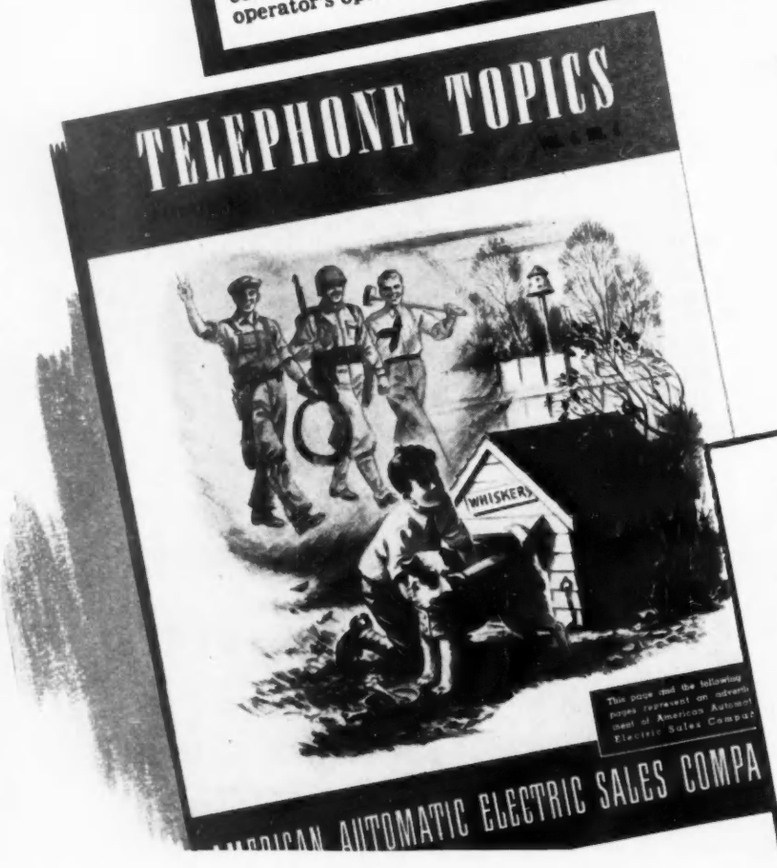
(3) (i) Any operator whose average value of inventory of material for the five calendar years prior to January 1, 1942, did not exceed $10,000, shall be exempt from the provisions of subparagraph (1) above.

(ii) Any operator whose use of materials for the year 1942 does not exceed $10,000, shall be exempt from the provisions of subparagraph (2) above.

(iii) Material delivered pursuant to subparagraph (b) (1) (ii), shall be exempt from the provisions of subparagraphs (1) and (2) above.

(iv) From time to time, the Director General for Operations may determine that certain operators are exempt in whole or in part from the restrictions contained in subparagraphs (1) and (2) above.

(f) *Sales of material from excess stock.* Any operator may sell to any other operator materials from the seller's excess stocks or inventories, provided that a preference rating of A–1–c or higher assigned by this order, or any preference rating certificate, order, or other direction issued by the Director General for Operations is applied or extended to the operator selling such materials; and any such sale shall be expressly permitted within the terms of subparagraph (c) (2) (iii) of Priorities Regulation No. 13.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The free classified pages of the Telephone Topics section of Fortnightly Telephone Engineer offer you a nationwide service to help you dispose of surplus material to comply with the new inventory restrictions.

Under the terms of Preference Rating Order P-130, many telephone companies must comply with certain inventory restrictions before they can accept materials for maintenance, repair, operating supplies or operating construction. Companies that find themselves overstocked on certain items will want to dispose of them so that they can buy material they urgently need.

To help you find buyers for your surplus materials, we offer you, free of all cost, the use of the classified pages of Telephone Topics, in Fortnightly Telephone Engineer. Here you may advertise your surplus inventory for sale or find an offer of material you badly need. Telephone Topics will thus serve as an effective clearing house to help you maintain a balanced inventory under the new restrictions. It is a service which we gladly contribute and which we are sure you and other telephone men will find mutually helpful.

Classified advertisements listing available material should be as brief as possible, and as many will be published as available space permits. Advertisements for the November 1 issue must reach our office on or before October 26. Address them to: S. A. Martin, Editor, Telephone Topics, 1033 West Van Buren Street, Chicago.

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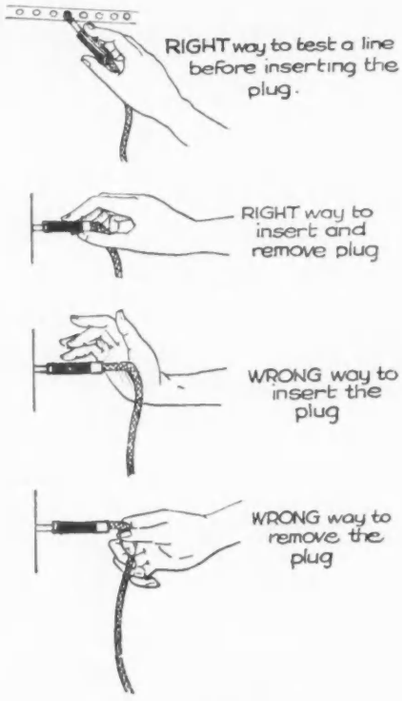
RIGHT way to test a line before inserting the plug.
RIGHT way to insert and remove plug
WRONG way to insert the plug
WRONG way to remove the plug

Fig. 1—Proper handling of cords.

Conservation of Critical Materials

By B. C. BURDEN

Transmission Engineer—L. T. & T. Co.
Lincoln, Nebr.

General

NOW as never before managers of telephone properties have an opportunity to show real executive ability and to not only do a better job of managing their plants but at the same time help the war effort. A telephone plant is much like an automobile in that given proper "preventive maintenance" it will outlast two to one the plant that is neglected.

We in the "land of the free" are accustomed to an abundance of everything and it is hard to realize that temporarily the more abundant life is, or should be, a thing of the past.

As a good example of the detrimental effect on the war effort of deferred vs preventive maintenance and again talking about cars consider the simple item of cables which connect the storage battery of our automobile to the starter. Because the average driver pays little attention to the storage battery until it fails to function, many thousands of pounds of copper, together with rubber and textile insulation, must be fabricated into new cables and connectors each year, thus not only using up materials vital to the war effort but also tieing up vitally needed manufacturing machinery and manpower. Which brings us to our key point that a negligible amount of attention in the occasional cleaning of the battery terminals plus the application of a small amount of grease over the terminals would not only prevent useless sacrifice of materials needed for armament but would actually pay dividends in avoiding the inconvenience from breakdown that is always a by-product of deferred maintenance.

In the telephone business (as in any other) there is likewise ample opportunity to conserve on vital items such as rubber, copper, tin, etc., by a program that both prolongs the life of telephone plant and more efficiently utilizes existing telephone facilities.

It is the purpose of this article and one to follow to discuss in detail a program having as its purpose the reduction to a minimum of telephone company requirements for replacement materials during this critical period.

It would seem that if the industry wholeheartedly adopts and follows the practices recommended that it would be entitled to maximum consideration when replacements cannot be avoided.

Essential Features of Program

FOR purposes of discussion we can consider that our problem of getting the maximum life out of existing telephone plant has two divisions, viz:

1. A **preventative maintenance program** that insures maximum life from all items of existing plant.
2. The **efficient utilization** of existing central office subscriber line circuits, and cable plant so as to get maximum use from what we already have.

The essential feature of any preventive maintenance program is to anticipate excessive wear and tear on telephone plant and to remove the source of trouble. In the good old days (which will be back) a preventive maintenance program carried with it a more or less generous policy of replacement of prematurely worn out or slightly damaged plant as past experience had shown that temporary or makeshift repairs were in the end almost as costly as complete replacement with new.

Obviously this policy will not fit present day conditions and we should consider replacement only as the last resort. It might seem that such practice would eventually result in lowered service standards and run down plant. Whether or not this is true will depend on the thought and care that is put into a preventive maintenance and conservation repair program.

Central Office Apparatus

IN considering how we can help the war effort by a well planned and executed preventive maintenace program let us first turn to the central office.

Opportunity for conservation of critical materials is less pronounced in dealing with the central office than with outside plant, nevertheless there

is some opportunity and every pound of copper saved means that many more slugs to let light into the honorable interior of Mr. Moto and other "sons of heaven."

The M.D.F. has always been a source of waste due to the tendency to consider that the only way to run a jumper is to take it off the roll and thus avoid the trouble of fishing a piece of used jumper wire out of the wire box. Likewise the common tendency to let dead jumpers accumulate on the frame, whereas they could just as well be utilized and thus save running new wire.

If say only 1,000 Independent companies would save 100 feet per year and thus avoid absorbing from the telephone market 100,000 feet, this small saving would run all the jumpers for the central office M.D.F. in over 20 typical defense projects.

Make it a rule to either remove all dead jumpers and carefully save the wire or if it is desired to leave them in place with the thought that they can be utilized for new subscribers mark them so that they can later be used rather than new wire.

See how long you can go without touching your roll of new wire. Remember that every 1,000 foot roll of wire you order ties up not only copper but insulating material, manpower, transportation, and a host of other items that go into every finished product.

In soldering work in the central office, keep in mind that a little more care in preparing the joint will make it solder easier, better, and it will generally take less solder to do the job.

Care of Switchboard Cords

SWITCHBOARD cords are another item that offers interesting possibilities in the way of getting much longer life by proper maintenance practices.

The conductors in switchboard cords, due to their constant handling, eventually part and the cord goes open or at least noisy. The remedy is of course to "cut back" the cord several inches so that the break in the conductor is eliminated. The "cutting back" process can be continued only to the point where the cord becomes so short that it is not long enough to reach the most remote jack on the board at which time it would seem it is ready for replacement.

However on many boards it could be continued in service for many months by merely shifting to a more favorable position on the key shelf. For example cord 15 in a typical board may not require as long a reach as does cord No. 1, hence, shorter cords

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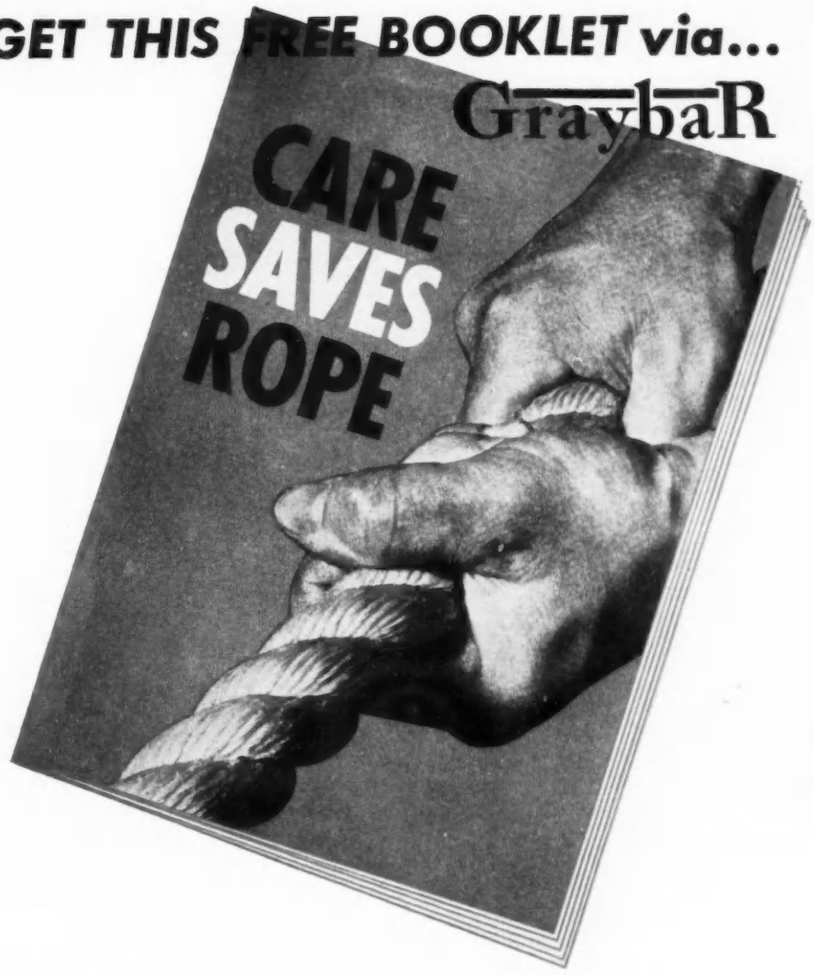

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can be shifted into this part of the key shelf and continue to give service long after they would normally be thrown away.

The frequency at which cords require cutting back will depend upon how the operators handle them. They should be instructed to insert and withdraw plugs by holding the plug between thumb and index finger as shown in Fig. 1 and with middle finger placed on bottom of plug. They should also be cautioned against the practice of pushing the plug into the jack by pressing with the palm of the hand against the cord, or equally bad, yanking the plug out by means of the cord.

Methods of Cutting Back Cords

MANY of the small Independent companies do not cut back cords because of their lack of familiarity with the method to be employed.

Cords should be cut back as follows (see Fig. 2):

Step No. 1—Cut off the defective or worn portion of the cord and slip outer braid back. Next remove 1½" of the inner braid.

Step No. 2—Pull the outer braid forward.

Step No. 3—Apply serving of No. 35 -2 ply linen thread as shown to hold braid from slipping back when plug is screwed onto the cord.

Step No. 4—Trim off spiral binding strings and cut conductors to proper length to reach terminals in plug.

Methods of Attaching Conductors to Terminals

USE ONE of the following methods for attaching the cord conductors to terminals in the plug.

Method A—**Wire terminal method**—Slide the conductor braid back ¼" on tip and ring conductors and thread a No. 28 copper wire through the strands of the tinsel conductors. Leave a loop at one end and wrap the wire tightly around tinsel conductor. Draw threaded end of wire so as to remove loop and twist the two ends together. About 1" of wire should be left for attachment to terminal. The braid on the sleeve conductor should be pushed back and the bare conductor pressed back against the cord and the plug screwed on. The No. 28 wire should next be placed under the terminal screw and the excess cut off. The conductor braid should be slipped down flush with the terminal screw.

Method B—**Soldered tip method**—This method consists in wrapping the tinsel conductors with a fine tinned wire and then soldering to regular cord tips. In some cases tips are pressed on (this requires a special press and die.)

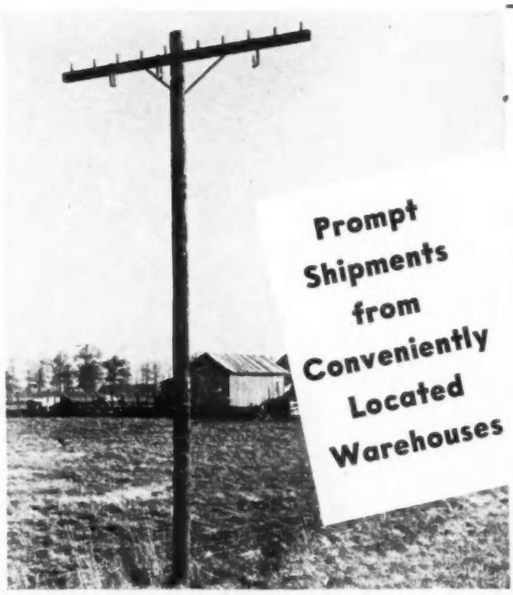
Method C—**Punched hole method**—This method consists in merely sliding the braid back on the tip and ring conductors and punching a small hole through the strands near the end. This method is both simple and effective.

The telephone manufacturer whose equipment is used should be consulted for the correct method of rebutting and cutting back the type of cord in use.

Plug Inspection and Cleaning

PLUGS should be inspected for loose terminal screws and worn or bent body. Plug gauges can be obtained from the telephone supply houses which will indicate when the contact surfaces have worn excessively. Plugs which are badly worn will cause poor transmission, faulty signalling, etc.

A most important feature of a C.O. maintenance program is plug cleaning. Though not generally appreciated it is a fact that a film of grease and oxide forms on the contact surfaces of a plug in a very short time (especially in the summer). This film is not apparent to the naked eye, but it will very materially affect transmission,



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	Length	Weight
No. 1-WE Pruner Head Section	30 in.	2¾ lbs.
No. 44-WE Saw Head Section	30 in.	1½ lbs.
Intermediate Extra Section	52 in.	1½ lbs.
Bottom Extra Section	52 in.	1¼ lbs.
No. 1-WE Pike Pole Attachment	8 in.	1½ lbs.
TOTAL WEIGHT		8½ lbs.

This combination can be quickly and easily assembled to make any of these three tools:

1 Heavy Duty Tree Trimmer (1¼" capacity)	10½ ft.
1 Fast-cutting Pole Saw	10½ ft.
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causing a loss which may be as high as that of several miles of circuit and which might make it appear that a cord needed repair or replacement. This film is caused from perspiration and the natural grease from the operators hands and can be removed by polishing. For the small office there are two ways by which this may be accomplished.

Method No. 1—Polish the surfaces of the plug with a soft rag and a mild abrasive compound. The compound is placed on the rag which should be rotated around the tip, ring, and sleeve contacts being careful to apply an even pressure so as to remove the film from all sides of the plug. Remove excess compound with clean rag after polishing.

Method No. 2—This method utilizes a piece of cotton sleeving or several strands of cotton string which have been saturated in a mild polishing compound. One end of the sleeving or cord is attached to a small screw under the bottom of the key shelf and then wrapped once around the plug and the free end is held in the hand. The contact surfaces are highly polished by drawing the plug back and forth along the string. Care must be taken to see that the tip and ring contact surfaces as well as the sleeve are properly cleaned.

Method No. 2 is somewhat faster than No. 1 and if carefully done should give just as good results.

Use of Treatment to Preserve Cord Insulation

SOME companies have a practice of periodically treating with hot paraffin about 12 inches of cord near the plug. This is accomplished by holding the cord over a drip pan and pouring hot paraffin over it. It is claimed that this greatly prolongs the life of the textile covering, thus eliminating the need for frequent "cut backs" particularly in the summer months when perspiration from the operators hands tends to deteriorate the cord covering very rapidly.

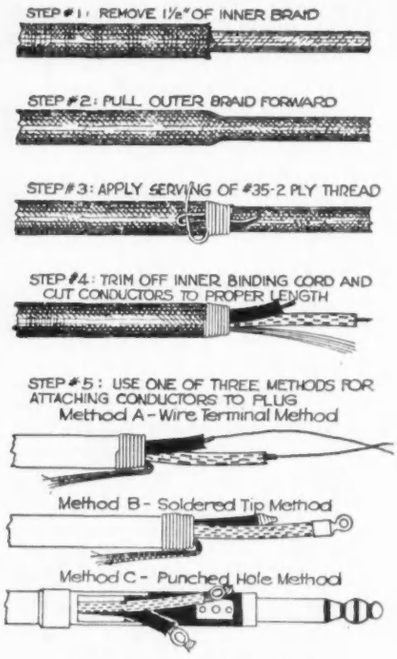
STEP #1: REMOVE 1½" OF INNER BRAID
STEP #2: PULL OUTER BRAID FORWARD
STEP #3: APPLY SERVING OF #35-2 PLY THREAD
STEP #4: TRIM OFF INNER BINDING CORD AND CUT CONDUCTORS TO PROPER LENGTH
STEP #5: USE ONE OF THREE METHODS FOR ATTACHING CONDUCTORS TO PLUG
Method A - Wire Terminal Method
Method B - Soldered Tip Method
Method C - Punched Hole Method

Fig. 2—Cord repair methods

The necessity for replacement of switchboard and supervisory lamps which do not glow as brightly as new ones can often be avoided by merely cleaning the glass lens that cover the lamp. The accumulation of dust on the back side of the lens together with a dirt or grease film on the front side is sufficient to cut the brilliance as much as 50%.

Here again is a small item that seems insignificant in itself, yet when multiplied by the thousands of lamps that might be saved annually over the country as a whole it becomes important.

Subscribers Sets and Wiring

IN THE past the practice of many companies has been to replace defective elements in telephones with new elements or possibly make replacement of the complete instrument. The defective unit was then returned to the telephone office where it was either

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repaired and put into stock, or as was too often the case merely allowed to accumulate and be eventually junked.

The desirability of keeping requisitions of new apparatus to an absolute minimum now makes it necessary I believe for telephone companies to either be prepared to repair every defective unit taken out of service (so that it can go into stock for future replacements) or to arrange to send defective units into the manufacturer (most of whom now offer repair service at reasonable charges) for repair.

Repair facilities, if not already available, can easily be fixed up and should consist essentially of a work bench, a few tools which are those used in ordinary telephone work and which will be already on hand, and an ohmmeter. If an ohmmeter is not available one can easily be contrived out of an old D. C. voltmeter or milliammeter. The bench should also be equipped with a small oil can (for magneto generators) and cleaning and polishing fluid and cloth for use in cleaning up old telephones.

When elements such as generators, receivers, induction coils, and magnets show "open" on an ohmmeter test, always examine the windings at the point where they connect onto the terminals as in many instances the open occurs at this point and can be easily repaired. If the open appears to be within the winding itself, it should be sent to the factory or any good telephone repair shop to be rewound.

The armatures of generators should be rewound from the generator assembly before being sent in in order to save on transportation costs, and equally important to help the already overburdened transportation system.

(To be Continued)

Okays Sale Consummated Twenty-Five Years Ago

THE Public Utility Commission of Pennsylvania has approved the acquisition by Northeastern Pennsylvania Telephone Company of all the rights, powers, franchises and privileges of Anthracite Telephone Company.

The required Commission approval was never sought until now, so the application just acted upon was filed to correct an oversight of 25 years ago in not obtaining the required approval from the Public Service Commission.

The service includes Forest City and vicinity, Susquehanna County, and small parts of Lackawanna and Wayne Counties. Chairman John Siggins, Jr., being absent did not participate in the vote on the order.

Anthracite went into receivership in 1914, and on October 3, 1916, all its property, rights and franchises were sold at a receiver's public sale for $6,215 to Northeastern. The sale was confirmed by the Lackawanna County Court on March 7, 1917.

Anthracite's corporate existence came to an end and approval of the dissolution by the then Public Service Commission was not required but approval of the acquisition by Northeastern of the rights, powers, franchises, and privileges (but not the physical property) was required by the then Public Service Company Law. Substantially indentical requirements are effective under the existing Public Utility Law.

Notwithstanding that Anthracite's corporate existence ended in 1917, its tariff which differs slightly from Northeastern, was allowed to remain in effect, and certain former Anthracite business subscribers have been billed by Northeastern at Anthracite's rate, which is higher than Northeastern's. With the termination of the fictional existence of Anthracite, Northeastern will now extend its rates to these subscribers, resulting in a reduction of 25 cents a month.

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Communications and Electronic Developments

The Varistor

One of the new devices that has made its appearance in the telephone field in recent years is the copper oxide varistor. It has the merit of offering an extremely high resistance for potentials supplied across the terminals in one direction of polarity and a very low resistance for potentials which may be applied across the terminals with opposite polarity. A typical application of a varistor is as a shunting device across an operator's receiver circuit to avoid bad acoustic shock due to high momentary or transient voltages that may be impressed.

These units are so designed that their resistance may change as much as one to ten thousand when the polarity across their terminal reverses. These units consist of a disc of copper which is so treated as to form a layer of cuprous-oxide on one face of the disc. When the potential across the oxide side of the disc is negative the resistance is maximum and when the potential is positive the resistance is minimum. The term, **varistor,** comes from the fact that it is a variable resistor.

High Frequency Tone Test Set

A new development being used by some of the larger companies where cable pairs must be identified without disturbing them, uses a high frequency inaudible tone source. This new method makes use of a high frequency oscillator and a receiving amplifier and a demodulator. The high frequency oscillator utilizes a 250 kilocycle wave modulated at 500 cycles. This high inaudible frequency being well above the highest carrier frequency used in cable work cannot cause any trouble with either carrier or voice circuits.

At the receiving end of a testing set up an amplifier and demodulator is used in conjunction with a feeler probe consisting of a coil of fine wire in a bakelite tube.

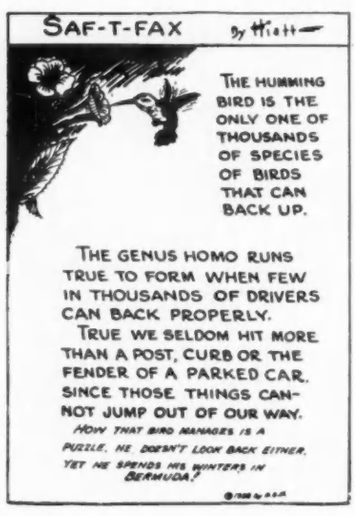
In use the modulated oscillator is connected to one side of a pair to be located while the other side of the test set is grounded. At the other terminal of the cable under test the amplifier and demodulator is connected to the probe.

When the probe is held close to the wire which has the oscillator connected to it, a tone will be heard in the headphone. When the actual pair is located the sound will be a maximum.

This type of test set can be used over long cables because of the high attenuation of the 250 kilocycle frequency used. It is ideal for testing between manholes and for relatively short lengths of cable.

Novel Magnet Charger

An unusual method of charging permanent magnets is employed by one of the large telephone laboratories and consists in obtaining a very high current by charging a bank of 8.0 m.f. electrolytic condensers and then discharging these condensers through a coil consisting of a few turns of wire placed on the core or magnet to be magnetized. 400 eight m. f. are charged up to a 350 volt potential by means of a simple rectifier. The condensers are then discharged through the magnetizing coil. The discharge is passed through an ignition which prevents the current oscillating due to capacity and inductancy present in the circuit.


SAF-T-FAX
by Hiatt
THE HUMMING BIRD IS THE ONLY ONE OF THOUSANDS OF SPECIES OF BIRDS THAT CAN BACK UP.
THE GENUS HOMO RUNS TRUE TO FORM WHEN FEW IN THOUSANDS OF DRIVERS CAN BACK PROPERLY.
TRUE WE SELDOM HIT MORE THAN A POST, CURB OR THE FENDER OF A PARKED CAR, SINCE THOSE THINGS CANNOT JUMP OUT OF OUR WAY.
HOW THAT BIRD MANAGES IS A PUZZLE. HE DOESN'T LOOK BACK EITHER, YET HE SPENDS HIS WINTERS IN BERMUDA.

Solder Substitutes

90% of our tin supply has been cut off by the Japanese invasion of Malaya, Burma, and the Dutch East Indies. The telephone industry can expect before long a substitute solder which eliminates the need for tin. Most of the solder we have been using consists of 40% tin and 60% lead.

Let us consider the effect of alloys other than tin. Tin serves the purpose of "wetting" or alloying with other metals, whereas the lead strengthens the solder joint and also lowers the melting point of the solder. Used by itself, lead will not work, because it will not alloy successfully with most other metals. Substitutes that have been suggested in place of tin are cadmium, indium, and silver. Cadmium is also a critical metal like tin at the present time. Indium, while fairly satisfactory as an alloying element is still too expensive for ordinary use. Silver seems to hold forth the greatest promise. In experimental work with it as an alloy a composition of 97.5% lead and 2.5% silver has given fairly decent results provided an oversize soldering iron is used. This is due to the fact that silver has a much higher melting point than tin. The ordinary hundred watt iron found in most central offices will not give adequate results and experiments indicate that a 200-watt iron is required to work properly.

The W.P.B. has already ordered solder use for civilian activity reduced to 16% tin and 84% lead and it is found that ths solder works best with the larger iron. Although the solder that may be available in the future may not be as good as what we are accustomed to nevertheless giving proper attention to the need for adequate heat, it can undoubtedly be made to work satisfactorily.

CONVENTION REPORT

(Continued from page 56)

George Rodormer was a genial host, bad arm and all, to president-elect John R. Porter and your photographer.

to eliminate the need for more stringent curtailment and rationing of telephone service. He called upon those present to acquaint their operators promptly with the details of the priorities system which becomes effective Nov. 1, adding that lists of officials and agencies entitled to prompt service are now being placed in the hands of all companies.

Fly said that congestion of phone service in certain areas may require campaigns for the voluntary reduction of social calls. Such publicity campaigns, he said, should make known the hours of peak loads and should demand that during these periods none but urgent calls be put thru.

Oscar Burton, vice-president and general manager of the Gulf States Telephone Co., Tyler, Texas, delivered a memorial to E. R. Hannibal, a director of the Association and vice-president and general manager of the West Coast Telephone Company, Everett, Wash., who passed away August 5. The resolution was a very touching tribute to Ray Hannibal and was signed by the Resolutions Committee with Mr. Burton as chairman and B. L. Fisher and Wesley M. Angle as members.

Another resolution was unanimously adopted resolving that the USITA pledge their full support to the all-out war effort of the Government and the people of the United States in the prosecution of the war. It calls for full cooperation of all the Independent telephone industry to the end that the Independent telephone industry may be, as it has always heretofore been, of the greatest possible service to the nation in this critical time.

The Traffic Conference met the afternoon of the closing day with Mrs. Mayme Workman as Chairman.

Traffic problems resulting from the War Effort was the major theme of the conference. Traffic experts from four states conducted a panel discussion. Members of the panel were: Esther M. Hummel, Traffic Supervisor, Illinois Commercial Telephone Co., Springfield, Ill., Lydia R. Mielke, Traffic Superintendent, Tri-County Telephone Company, South Haven, Mich., R. C. Ross, Commercial and Traffic Superintendent, Portsmouth Home Telephone Co., Portsmouth, Ohio, and G. E. Slusher, General Traffic Supt., Pennsylvania Telephone Corp., Erie, Penn.

A highlight of the traffic session was an address by R. A. Phillips, president of the Association.

Members of the committee were: Mrs. Workman, Chairman, R. S. Brewster, Edith F. DeWitte, Harry E. Nott, R. F. Pagels, Louise Pohlmeyer, L. F. Shepherd.

An Open Forum was held at the finish of the session and after unfinished business was dispensed with the 1942 convention was adjourned.

Our Editor catches John R. Porter, Garland B. Foscue and J. K. Johnston resting between sessions during the National Convention of the U. S. Independent Telephone Association. Mr. Johnston is known as the "Daddy" of the Independent Pioneer Telephone Association.

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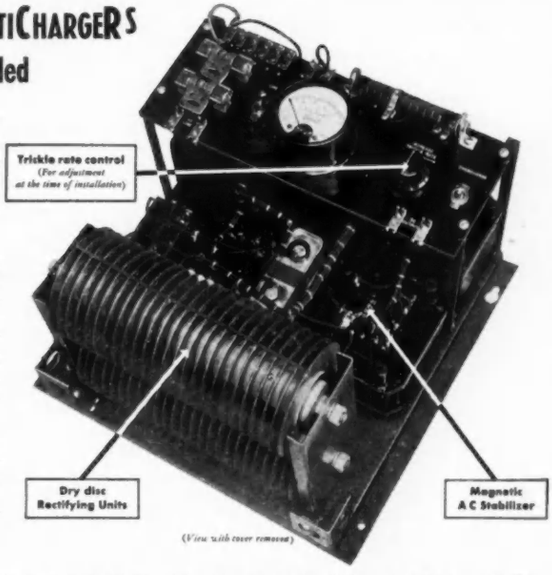
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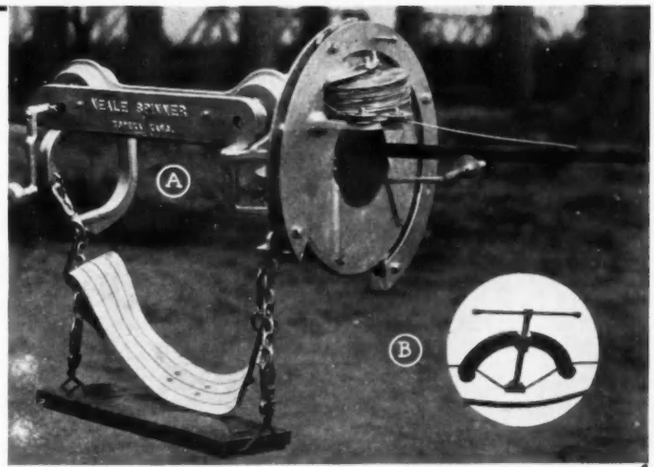

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Personals from the field

W. J. McQuiston president of the Elmwood, (Ill.) Telephone Exchange, died at his home in Elmwood on Sunday, September 13, at the age of 84 years. We extend our condolence to his widow and to his sons, H. H. McQuiston, secretary of the Elmwood Telephone Exchange and M. J. McQuiston, supervisor of local operating practices, Illinois Bell Telephone Company, Chicago.

•

J. F. Behan, treasurer of the American Telephone and Telegraph Company, announced Sept. 28 that beginning October 1, the Company's temporary Fifteen Year 3% Convertible Debenture Bonds due September 1, 1956 are exchangeable for definitive Debenture Bonds at the office of the Trustee, City Bank Farmers Trust Company, 22 William Street, New York, N. Y.

•

R. V. Clark is the new manager of the Hunter, Garber and Pond Creek, Okla., exchanges of the Western Light and Telephone Company.

H. H. Jordan, district manager for the Southwestern Bell Telephone Company at East St. Louis, has been transferred to the staff of division superintendent **J. E. Bennett** with office in St. Louis. **E. F. Gaines,** formerly a division supervisor in St. Louis, has been named district manager at East St. Louis.

•

L. Metcalfe Walling has been appointed to head the newly consolidated government divisions of the Wage-Hour Division which has been combined with the Public Contracts Division of the Department of Labor. The new unit will have national headquarters at New York city.

•

William J. Heidenreich, 56, for 31 years an employee of the Wisconsin Telephone Company, died in early September at his Fox Lake, Wisc. summer home.

•

George Hardacre, who has been wire chief for the Miami County (Kans.) Mutual Telephone company the past 20 years, has resigned and accepted a similar position with the northern division of the United Telephone Co., of Kansas City.

•

S. W. Teas, manager of the Floresville, (Tex.) Telephone Company, reports heavy losses caused by the tropical hurricane in his section last month. Almost 75% of their phones were out of service in Poth and Floresville. Rural lines were practically all out and drops were down in all sections. The rural phone owners aided in restoring service.

•

Ted Hunter, Sr., wire chief at the Ocean Park, Calif., exchange of the Associated Telephone Co., Ltd., is now pinch hitting for his son, **Ted, Jr.** for the company magazine ASSOCIATED CIRCLE while junior is serving at a foreign base with the armed forces. **Ted, Jr.** was an associate editor of the magazine, and his dad a veteran of the 91st Division with foreign service in World War I.

•

Word has been received from the War Department that **Kenneth Montgomery,** a former employee of the Mid-West States Telephone Company, in Illinois was killed in action, place and date not named. He would have been 24 years old next January.

•

Willard E. Henges, with Graybar Electric Company since 1913, became St. Louis-Graybar's new District Manager on September 15. He replaced George Corrao, who has asked to be relieved of active duty subject to retirement next year.

•

Charles B. Applegate, 52, plant chief at the Ohio Bell Telephone Co., at Alliance, Ohio, died of a heart attack recently while sawing wood near his home. He was past president of the Alliance Kiwanis Club.

•

Earl Chambers, who has been employed at the Corning, Ia. exchange of the Western Light & Telephone Company for over a year, has been promoted to manager of the Corning office. Prior to the manager job, he was employed as a wire chief.

•

W. C. Kirk recently succeeded Mr. Probasco as district manager for the Central Kansas Telephone Company. **Mr. Kirk's** headquarters are at Garnett. He was promoted from the local managership of the Mound City, Kan. exchange.

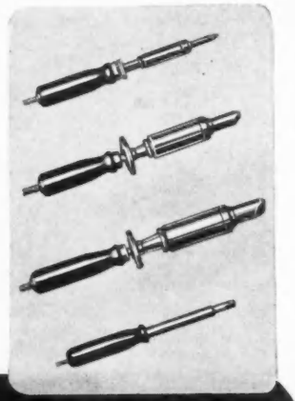
•

Lloyd Gray, manager of the Sharon Springs, Kan. exchange of the Ameri-

"American Beauty" Irons
SOLDER THEM ALL!

There's a 50-watt midget—a 550-watt giant—or any intermediate size you need in an American Beauty.

They are so compact, rigid and sturdy as to be almost indestructible. Soldering tips are easily changed by loosening a set screw. Handles never get hot. That's why telephone men depend on American Beauty.



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BRANCH WAREHOUSES AT DALLAS, KANSAS CITY, LOS ANGELES, RICHMOND (VA.) AND SAN FRANCISCO

can Telephone Company, is now the manager of the exchanges at Hill City, Morland and Lenora, Kan., with headquarters at Hill City.

●

Second Lieut. John A. Hayes, formerly manager of the telephone company at Essex, Ia., has reported to Ft. Monmouth for duty in the Signal Corps. **Mrs. Hayes** will be the new manager.

●

Dale Taylor is the new manager of the Western Light & Telephone Co. exchange at Cheney, Kansas, filling the vacancy caused by the resignation of **R. R. Helm.**

●

David Don, formerly power engineer for the Oregon Public Utilities Commission, has been promoted to the position of chief engineer filling the vacancy caused by the resignation of **Tom Russell.**

●

H. D. Taylor is the new manager of the American Telephone Company exchange at Troy, Kan.

●

George H. Norris, 52, an official of the Michigan Bell Telephone Company died early in September. He was PBX superintendent at the time of his death.

Scrap & Salvage

Here is an idea passed on by Leslie A. Gritten, secretary treasurer of the Oregon Independent Telephone Association in their Bulletin of September 29. It is a good suggestion and we repeat it in full.

"Help the national drive for scrap metal! Every ounce we can gather from our own piles should be sent to the junk men. Further, we should help our communities. Suggested, for example: Organize local committees, furnish them with room, tables and telephones, directories, instructions and mimeographed information. Then let them contact everybody they can telephone in your exchange area. Your colleges and service clubs will send you men and women to do the talking if you will furnish the wherewithal for a thorough telephonic canvass ... To our shame, we found scrap metal enough before Pearl Harbor to send it by the shipload to Japan . . . now let us send them what is left, by another and prouder medium—the muzzle of an American gun."

Who makes it?...
Who sells it?...
The 1943 BUYERS GUIDE will have all the answers.

Central Elec. & Telephone Co. Honors Employees in Service

The front cover of the September issue of the Central Electric & Telephone Co., Sioux Falls, S. Dak., house magazine "Public Service" carried a unique page size engraving of the honor roll of employees serving in our armed forces. A total of 56 names are already on the board which is a beautiful plaque with an American Eagle with outstretched wings at its top. Under the eagle are inscribed the words "Serving Our Country."

It was noticed that every name was a man's name. However, just give the girls time and there will be some WAACS and WAVES on the roll.

Telephone Lass Runnerup In State Golf Tournament

Anne Bathie, comptometer in the main office of the Central Elec. & Tel. Co. almost won the finals of the South Dakota women's open golf championship recently but had to be content with the runner-up position this year and a very handsome trophy.

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A WAR-TIME WARNING TO TELEPHONE PLANT OPERATORS

THE length of life . . . and the amount of profit . . . of a telephone plant operation . . . is in direct ratio to the quality of the service rendered to the talking public.

Satisfactory service can only be given when the lines and all equipment are free of faults. One should not wait until trouble actually impairs . . . or stops . . . service.

The wise Telephone Plant Operator fortells coming troubles promptly and accurately before they become serious, by regular and systematic tests.

Submit your testing and fault finding problems to Shallcross . . . there is a Shallcross instrument to answer your problem . . . and to fit your budget.

True, much of Shallcross facilities are applied to Victory effort . . . perhaps ***today*** your needs may be taken care of, but ***hurry!*** . . . perhaps ***tomorrow*** you will have to wait.

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Wire Chief's Training Course

(Continued from page 44)

there will be no crosstalk tendency. The same is true of the side to phantom, unbalances. In the formulas given the capacitances shown in the parenthesis must be equal to each other if the phantom and two sides are to be considered balanced. The actual unbalance is equal to the difference between the quantities expressed in the two groups of parenthesis in each equation.

Phanton cct. to
White Side cct.

$$U=\left(C1+C2+\frac{Cw}{2}\right)-\left(C3+C4+\frac{Cwm}{2}\right)$$

Phantom cct. to
Black Side cct.

$$U=\left(C1+C4+\frac{Cb}{2}\right)-\left(C2+C3+\frac{Cbm}{2}\right)$$

Side cct. to
Side cct.

$$U=(C2+C4)-(C1+C3)$$

Circuit of a Capacitance Unbalance Measuring Set

THE capacitance unbalance set is essentially an impedance bridge in which any unbalanced capacity which may exist is balanced out by an adjustable condenser which permits capacity to be added to the two wires which have a lower capacity than between the othre wires of the quad. The amount of capacity expressed in micro-microfarads (mmf) that must be added to obtain a balance can be read directly from the condenser dial. A constant frequency tone usually 1000 cycles is fed into one pair of wires. The balanced condition is determined by means of an ordinary headphone for when the circuit is balanced the voltage across the phone is zero, hence, no tone is heard. Fig. 4 illustrates schematically the connections in a capacity unbalance set arranged for testing **side to side unbalance.** It should be noted that capacitys C1, C2, C4 and C3 are similar to the A and B and R and X arms of a Wheatstone Bridge, except that they are reactances rather than resistances.

Testing for Phantom To Side Unbalance

A switching key is provided on the capacitance unbalance set which changes the connections so that phantom to side unbalance can be measured as shown in Fig. 5. Tone is fed into one of the pairs with the wires of the other pair shorted together and connected to the common point of the bridge; two resistance arms are inserted to make up the four arms of the Wheatstone Bridge circuit. Inasmuch as phantom to side unbalance may exist to either the white or black pair, it is necessary to make both a **phantom to white side** and a **phantom to black side** unbalance measurement. This makes a total of three measurements that are required to determine the unbalance measurements of a quad. A switching key makes it convenient to change the instrument connections in making the three measurements.

CAPACITY UNBALANCE DATA SHEET

Direction A		Splicing Diagram	Direction B		Resultant unbalance
Quad	Unbalance		Unbalance	Quad	
1	-15		-10	6	0
	-16		-15		1
	-10		+15		0

Fig. 6—Form for recording capacity unbalance data.

Significance and Use of Measurements Obtained

THE results obtained in the use of a capacity unbalance measuring set at capacity unbalance splices is recorded on standard forms. The magnitude and polarity of the unbalance is recorded for each quad. The polarity is determined by the dial setting which shows whether the reading is negative or positive.

One type of form used for recording capacity unbalance data is shown in Fig. 6. Its use can best be understood by referring to a typical example. Let us take quad No. 1 in direction A. The readings on this quad show a negative 15 unbalance between phantom and white side, a negative 16 between the two side circuits, and a negative 10 between the phantom and the black side.

After the readings are taken for the quads in both directions they are examined to determine what quads can best be spliced together so as to cause unbalances in opposite directions to either completely cancel or be greatly reduced. For example, quad No. 1 showed a phantom to white side unbalance of negative 15, side to side unbalance of negative 16 and phantom to black side unbalance of negative 10. Quad No. 6, which is selected to splice to quad No. 1 has a measured unbalance of negative 10 phantom to white side, negative 15 side to side and plus 15 phantom to black side. Now by connecting the white pair (quad No. 1) to the black pair (quad No. 2) in a **straight connection,** that is white wire to black wire and white mate to black mate, the negative 15 cancels out the positive 15, leaving zero unbalance. By connecting the black pair (quad No. 1) to the white pair (quad No. 6) in a reverse connection the negative 10 unbalance of Quad 1 and the negative 10 of quad No. 6 cancel leaving zero unbalance. Inasmuch as the white pair on quad 1 is connected to a black pair on quad 6 there is in effect a phantom transposition which reverses the polarity of the side to side crosstalk, hence the negative 16 and the negative 15 will cancel out leaving a negative 1 side to side unbalance. It can be seen that the overall unbalance is greatly reduced as a result of the proper "poling" of the two pairs of quads.

Fig. 7 illustrates the effect on polarity of the eight different ways in which the two quads may be connected together.

It is interesting to note that this same polarity relationship exists on open wire phantom groups.

Capacity Unbalance Limits

CONSIDERING a 6000 foot loading section with capacity unbalance splices at 3 points in the section, it is generally possible to bring the average capacity unbalance down to around 7 mmf for phantom to side,

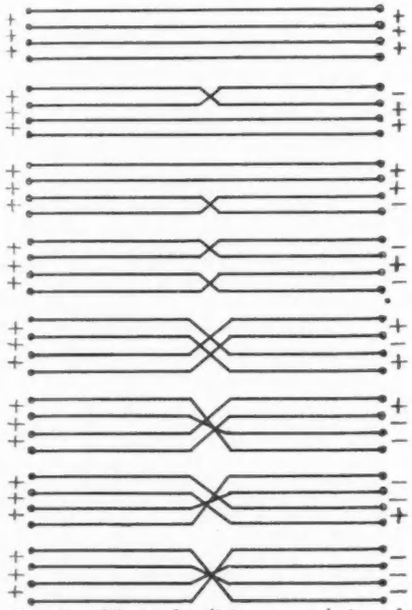

Fig. 7 — Effect of splicing on polarity of unbalances.

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1943
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Protek-Sorb Desiccant is approved and recommended by leading manufacturers and suppliers of telephone equipment.

Use Protek-Sorb Desiccant—avoid the hazards and inconveniences of out-dated methods of drying cable splices.

Your regular telephone jobber can supply you. Ask him for handbook instruction sheets.

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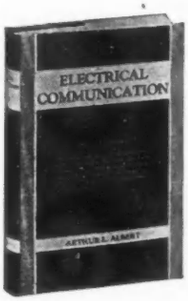

A study of the various specialized phases of electrical communication as related to the usages of modern communication systems. Nearly one-third of the content has been entirely rewritten and the remainder revised to incorporate recent advances. The main revision occurs in the chapters on Sound and Acoustics, Speech and Hearing, Electronics and Vacuum Tubes, Inductive Interference and Plant Protection, Electronic Applications in Wire Communication (especially the sections on Carriers and Repeaters), and Wireless Communication.

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Why pay wages to anyone for figuring the time of toll calls, when a Calculagraph would do this work more accurately and without cost?

Model No. 33

With a Calculagraph the operator simply pulls a lever when a toll call is started and finished. There is nothing to figure, nothing to remember.

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Made in spring-drive and electrically operated models suitable for every condition.

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Accurate Toll Timing to the Second!

and 10 mmf for side to side unbalances. The Bell System limits in the past have been set for 6000 foot loading sections as 7mmf and 10mmf respectively for phantom and side and with the stipulation that the maximum unbalance reading does not exceed 100 m.m.f. The term **average unbalance** represents the sum of all the phantom to side or side to side unbalances regardless of sign divided by the number of unbalances. In general 100 m.m.f. is a rather high maximum unbalance and would normally not be encountered.

The more important the toll cable under consideration the greater the necessity for keeping unbalances to a minimum. Cable circuits which have carrier circuits on them have much lower limits than those given above.

Capacity unbalance testing in loaded cables must be confined to loading sections and no capacity unbalance tests or splicing are required at the point at which the load coil is inserted in the cable pair. This is due to the fact that a load coil changes the phase of the voice currents passing through it, therefore an unbalance in an adjacent section.

It should be noted that the phantom to side balance is more critical than the side to side, hence the lower limit established. That is, for a given amount of capacitance unbalance more crosstalk would be created between a phantom and a side than between the two side circuits.

Examination No. 19

CABLE SPLICING—QUADDED CABLE

1. **Why is quadded cable required where phantom circuits are carried through cable?**
2. **What is the basic difference between the three types of quads?**
3. **Explain what is meant by the term "capacity unbalance" as applied to quadded cable.**
4. **What is the purpose of the capacity unbalance set?**
5. **Explain the theory of operation of the capacity unbalance set when set up for measuring side to side unbalance.**
6. **How many test splices are usually made in a 6000 foot loading section?**
7. **Assume a loading section consists of three R, 2 A, and one B splice, what should be the order in which the splices are made?**
8. **If in a capacity unbalance splice quad 4 direction A measures Phantom to white side (—10), side to side (+28), phantom to black side (0), and quad 7 direction B measures phantom to white side (—10), side to side (—30), and phantom to black side (—5) and these two quads are to be spliced together, how should the pairs be poled and what is the resultant unbalance?**
9. **How low should the average side to side and phantom to side unbalances be reduced to be considered satisfactory?**
10. **Explain the purpose and use of BALANCING CABLE.**

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DESICCANT for CABLE SPLICING

DRIERITE dries the Cable Splice by positive absorption of all moisture from wires, insulation, bandage and surfaces inside the sleeve. Application is easy and rapid.

The snow-white granular **DESICCANT** is neither poisonous, corrosive nor abrasive, and does not evolve gas, fume or odor either in storage or in use. It eliminates all chance of fire, accident or discomfort to workmen or occupants of buildings.

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1 Quart Can (800 grams), 12 per Carton.

For Sale by the Manufacturer and leading telephone supply houses.

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Use of Balancing Capacity

It is sometimes necessary to make use of what is known as **balancing cable** or **balancing pair** in order to correct for phantom to side, or side to side unbalances which can not be brought down satisfactorily by means of capacity unbalance splices, and where importance or nature of the circuits carried justifies a complete balancing of each quad.

Another instance where a complete balance may be required is in connection with short lengths of toll entrance cable of the quadded type which may have been installed in years gone by without capacity unbalance tests but which due to present day use justifies a better crosstalk balance. In some cases where a non-quaded cable is used to carry phantom circuits into an office and where **it is desired** to produce an artificial capacity balance between selected pairs balancing cable is very useful.

Where the unbalances are large or where a number of quads require balancing, what is known as a **balancing cable** is used to provide the necessary capacity. Such cables consist of short lengths of 24 gauge cable consisting of 100 to several hundred pairs of wires. Each pair of wires has a definite capacity and the necessary pairs are spliced to the cable pairs to be balanced. As many pairs as are required are bridged across the four wires of the quad so as to produce the desired balance.

Balancing pair consists of special paired wire which has relatively high capacity per unit length and which is useful where only a few quads require correction. It is bridge spliced to the cable pair and layed into the splice.

Balancing cable has a mutual capacity of roughlly 4 m.m.f. side to side, 12 m.m.f. side to phantom. The capacity to sheath is 0 (side to side and 9 m.m.f side to phantom).

The balancing pair referred to above has a side to side mutual capacity of 9 m.m.f, 30 m.m.f phantom to side, and 25 m.m.f phantom to side to sheath.

General Corp. Station Report

The General Telephone Corp. reported Sept. 12 a station gain of 2,220 telephones in service for its subsidiaries for the month of August, compared with a gain of 3,145 for the same month last year. For the first eight months of 1942, the increase was 21,333, or 3.6% of the total operated by General Telephone affiliates, while last year's mark for the same period was 29,292, or 5.5%. The increase brought the number of stations in service in the General Telephone system to 600,838.

THE PIONEER'S CORNER

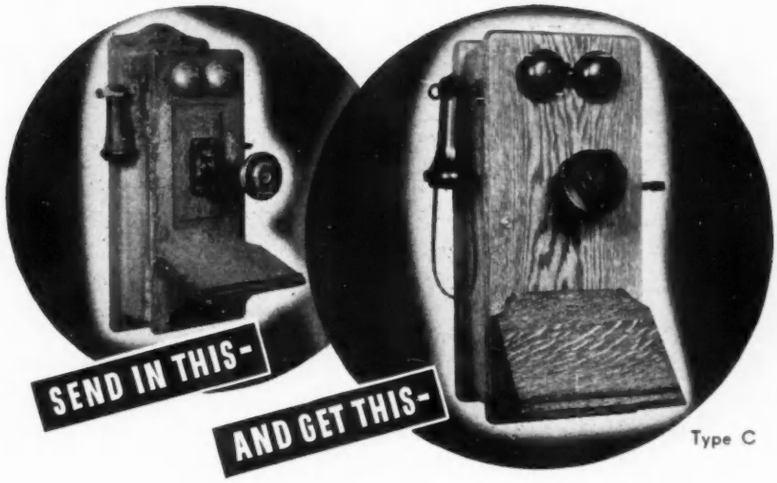
It is difficult for me to find something new to say about "Pioneering," because the very capable men who have preceded me during the past few months with such splendid articles left very little in the field of "Telephone Pioneering" to be covered, or uncovered.

However, as I look back over the past forty years of telephone service, I have tried to pick out the really "tough" times we all have been through, but somehow I feel like referring to them as the "good ole days," and feel like referring to the present time as the pioneering period. I always think of pioneering as a time when work has to be done and sacrifices have to be made, and from where I stand that time is here. Knowing Telephone Pioneers as I do, there is no doubt in my mind but they all can take this new era of pioneering standing up, AND when the worst comes to the worse we can always use those vacuum-headed Japs to float that river crossing, and I've been told that we won't need a priority number to get an ample supply of them.

But before I get caught off base, I'd better get back to the field of pioneering and try to say what I started out to say. It makes me proud to be able to associate with and be a member of such a fine organization as Independent Pioneer Telephone Association. This association really must have something that is dear to the heart of every telephone man, because just a few days back one of the "youngsters" with our company told me that it would only be "five more years," and when I asked him what he meant by "five more years," he explained that in just five more years he would be eligible for a ten (10) year service emblem of Independent Pioneer Telephone Association.

R. B. FAIRLY

MAKE "AR" REBUILDING PART OF YOUR MAINTENANCE PLAN!



Type C

For efficient operation under today's emergency conditions, make systematic rebuilding a regular part of your long-term maintenance planning. Don't wait until equipment falls to pieces or becomes unusable! Send in telephones, switchboards, P.B.X.'s, etc., for AR rebuilding and modernizing under a regular plan for increasing operating efficiency and lengthening useful life. Where we can, we'll lend you substitute equipment during the rebuilding period, if you so desire. Remember, AR rebuilding means a complete factory job by expert telephone craftsmen, and we rebuild, modernize or convert products to suit your needs. Write for prices and full information.

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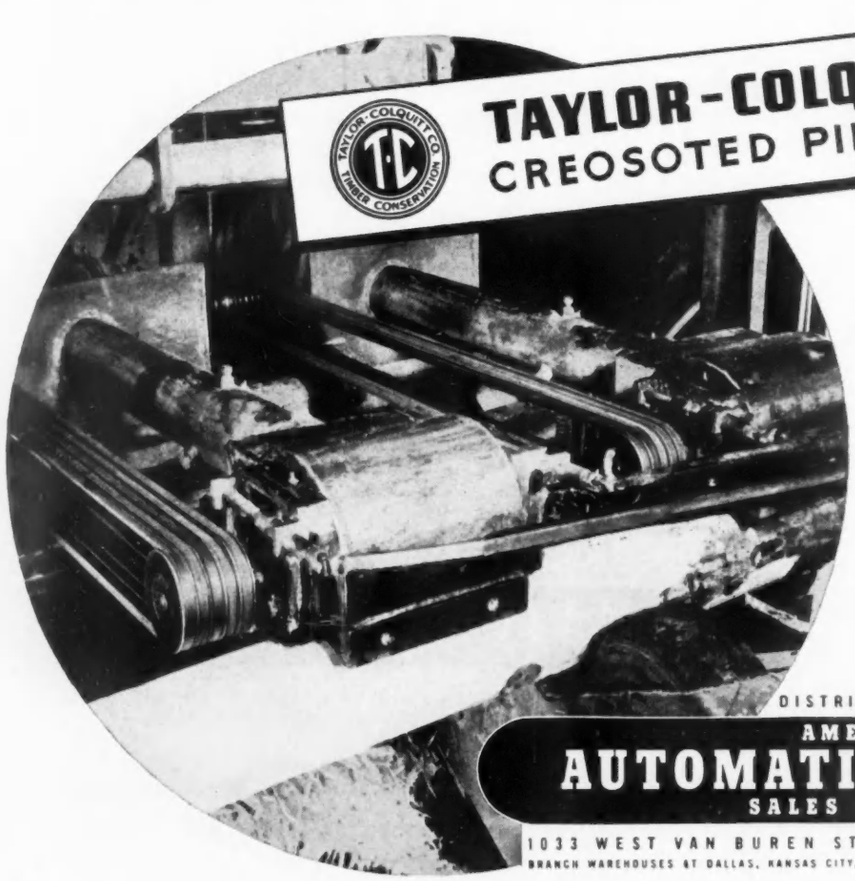

T-C Poles Are SMOOTHIES

To this strange contrivance T-C poles owe their finished look. It is one of several trimming machines built by Taylor-Colquitt Company through which poles are rotated to give them a smooth surface.

T-C poles not only are good looking but they will stand up for many, many years. And remember, long life means lower cost per year of service.

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Union Move

THE National Federation of Telephone Workers this week completed the move of its general headquarters from Chicago to Baltimore where its offices will be located at 306 North Charles Street. The general headquarters of the NFTW is composed of President Paul E. Griffith and National Secretary-Treasurer Bert E. Horth and most of the office force who had been with the NFTW in Chicago transferred to the Baltimore headquarters.

The NFTW Executive Board met Sept. 1-3 in the new Baltimore office, their first meeting since the national assembly. General policies such as wages, pensions and particularly the participation by the NFTW in Federal governmental affairs were discussed at the sessions. One proposal that was studied was the idea of the NFTW forming a telephone labor advisory committee to the WPB Communications Branch because independent unions are not represented on the present WPB Labor Committee.

Chief Engineer of A.T.&T. Named by General Harrison

Laurance G. Woodford, Chief Engineer of the American Telephone & Telegraph Co., is now on leave of absence from the Bell System in the post of Deputy Director of Procurement in the headquarters of the Army Services of Supply, under Brigadier General William H. Harrison, A. T. & T. Vice President on leave and former Chief Engineer. Mr. Woodford, who will be engaged entirely in Army procurement, retains his civilian status.

Mr. Woodford, who was made Chief Engineer of A. T. & T. last September, was previously Assistant Vice President in charge of the Operation and Engineering Department. He joined the Bell System in 1911 with the Northwestern Bell Telephone Co. in Des Moines, Ia., and has been on the staff of the O. & E. Department since 1932. He was successively plant inventory and costs engineer, plant extension engineer, operating results engineer, and plant operation engineer. He was advanced to the Assistant Vice President's post in July, 1940, when General Harrison left A. T. & T. to serve with the old National Defense Advisory Commission.

Fred E. Chandler Advanced By Wisconsin Bell

Fred E. Chandler, general traffic manager for the Wisconsin Telephone Co., was elected vice president and general manager of the company at the quarterly meeting of the board of directors last week. President William R. McGovern announced that Mr. Chandler will succeed William D. Hobbins, vice president and general manager since 1927, who retired Oct. 1. A veteran of more than 38 years of telephone service, Mr. Chandler came to the Wisconsin Telephone Co., as general traffic manager in 1915. In this position he directed the operations of more than 4,000 employees handling local and long distance telephone service in the 92 communities within the company's system. He entered the Bell System in 1904 with the old Chicago Telephone Co. after graduation from the Armour Institute of Technology.

Silver Use Is Saving Copper

Twenty-four million pounds of copper have been saved in the last few months by substituting silver for copper in electrical conductors, it was announced today by the War Production Board, Conservation and Substitution Branch, through Harvey A. Anderson, Chief.

This saving represents enough copper to make 95,000,000 aircraft machine gun bullets, plus 600,000 anti-tank shells, plus 1,500,000 anti-aircraft shells.

Plans for substitution of silver for copper were developed before Pearl Harbor and many projects using such substitution have been inaugurated and have been accomplished through the action of the Conservation and Substitution Branch.

Copper is being replaced by silver in plants where electrical connections are a significant feature of production. Bus bars, which are large slabs of metal used to conduct up to 3,000 amperes of current, windings for transformers and similar electrical appliances are being made now with silver.

A minimum of 34,000 tons of silver has been allotted to the Defense Plant Corporation by the United States Treasury and must be returned after the war. The Defense Plant Corporation is lending this silver to those plants that must have large quantities for operation, that can conveniently protect the silver, and that are in operation almost constantly. The silver is made available with the stipulation that it can be used only for a non-consuming purpose.

Pay $5,847,140 in Taxes

Excise taxes paid by users of telephone, telegraph, radio and cable services in August amounted to $5,847,140.90, while local telephone service levies totaled $4,561,438.28, the Bureau of Internal Revenue announced Sept. 22.

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THE CLASSIFIED TELEPHONE DIRECTORY can help keep your things in good repair for the "duration" whether it's a tricycle or an automobile.

Look in the Classified and see how easy it is to find tradespeople who can serve you. Under easy-to-locate headings you will find the name, address and telephone number and in many cases information to aid you in choosing those who can help you most satisfactorily.

MAKE THE CLASSIFIED YOUR BUYING GUIDE

The advertisement above tells consumers how and why to use the classified directory. The one on the opposite page shows the readers of publications addressed to dealers in various lines how and why to advertise in the directory. These advertisements are representatives of two campaigns that are appearing during the year. . . . Advertising of this kind should help the entire telephone industry by increasing directory usefulness and usage, as a buyer's guide and a seller's tool.

AN ADVERTISEMENT OF THE BELL TELEPHONE SYSTEM

ONE FUEL COMPANY'S ADVERTISING IN THE CLASSIFIED DIRECTORY ATTRACTS MANY PROSPECTS

☐ This man wants OIL BURNER PARTS

☐ This man wants to buy KEROSENE

☐ This man wants his OIL BURNER REPAIRED

☐ This man wants to BUY FUEL OIL

☐ This man wants to buy RANGE PARTS

☐ This man wants to buy WHOLESALE FUEL OIL

Check how many would be prospects for you

"You get out of it what you put into it," reasons the Efficiency Oil Heating Co. That's why they give so much point-of-sale information in their Classified Telephone Directory advertising.

Many concerns, too, arrange for advertising under those headings in the Classified where prospects would be likely to look for a given product, such as: "Air Conditioning."

A Directory Representative can advise you how to plan your advertising to attract more business. Reach him by calling the telephone company business office.

Transmission Power

In Local Battery Systems

By JAY G. MITCHELL

Transmission power an element entering into operating costs—Essential that supply of TRANSMISSION POWER be adequate and constant—Primary batteries as used in local-battery systems—Predominating importance in this service of the Dry Cell—Primary requisite in dry cells for telephone service — The local-battery transmitter circuit—Three essentials in telephone local-battery power supply—Importance of proper purchasing specifications —Available test data.

TO THE telephone executive an important component of the operating expense is the annual cost of TRANSMISSION POWER. Such cost is, of course, affected by the present day emphatic necessity of maintaining adequate and satisfactory transmission and is directly related, in many respects, to Maintenance of Plant and Equipment. In the common-battery plant line leakage increases the drain on the common battery and the cost of TRANSMISSION POWER but contributes nothing and detracts somewhat from the overall transmission efficiency of the plant. The fact remains, however, that the TRANSMISSION output of the average subscriber's substation equipment is directly affected by the dependability and volume of the direct current available to actuate the transmitter.

A Condition Common To All Systems

THIS characteristic of common battery systems is an exact counterpart of that obtaining in local battery telephone exchanges although the TRANSMISSION POWER in such cases is supplied by a number of widely distributed individual power plants in the form of local batteries. The use of the local battery at the subscriber's substation imposes upon the telephone executive the duty of providing as nearly constant and uniform average transmission power as possible in many diverse circumstances without, at the same time, incurring excessive costs for the entire local battery system. Because of the lack of uniformity in the number of hours per month during which subscribers' telephones are in use the provision of fairly uniform and adequate transmission in the local battery telephone system is intimately related to the purchase of batteries especially designed for the service and having, therefore, very definite characteristics.

Dry Cells for Telephone Service

BY far the greatest number of primary batteries, as distinguished from storage batteries, in use for TRANSMISSION POWER are of the so-called "dry battery" type. Telephone service has been found, moreover, to require dry cells having entirely different characteristics from the dry cells which are suitable primarily for other kinds of service. In the thorough study which has been given to the matter it has been disclosed that telephone local battery service requires a type of dry cell which has, to a predominant degree the ability to maintain its voltage without destructive drop over relatively long periods under conditions which are characteristic of telephone subscriber's usage of his service. For comparison it may be noted that some other kinds of battery service call for dry batteries which deliver a high current output, the maintenance of a sustained voltage being, for such service, definitely of secondary importance. The conditions which must be met in telephone service are based, of course, upon the requirements fixed by the average subscriber's usage of his transmitter. There will always be found in every telephone system some subscribers whose usage of the telephone is so intensive and uninterrupted as to call for special provisions for supplying TRANSMISSION POWER but the purchase of dry batteries for telephone service in local battery systems must be made under specifications prescribed by the average conditions, as to usage and so forth, which obtain.

Electrical Characteristics of the Battery Circuit

THE telephone dry battery when in operation is an element in a local circuit which comprises the primary winding of the induction coil, the wiring of the telephone set, the transmitter and the battery. This circuit, except for the variations in the resistance of the transmitter when in operation, is, for any given type of equipment, reasonably constant in resistance. One of the conditions essential

to satisfactory and uniform transmission from any given type of telephone equipment is the delivery of current to the transmitter circuit which is as nearly constant in value as may be practicable. This is shown graphically in the curve, Fig. 1, and as will be noted means a very rapid loss in transmission, expressed in decibels, as the value of the current through the transmitter is allowed to be decreased. This curve, which is derived from some very general data and discloses only relative results, not specific for any given type of equipment, may be translated into an argument in support of the use, in telephone local battery service, of dry cells which have the characteristic of long continued voltage maintenance under service conditions. The slightest reflection will show that in a given circuit of practically uniform resistance, such as the local battery transmitter circuit, a more nearly uniform current will be produced when the battery sustains its voltage under service conditions.

Dry Cell Essentials For Telephone Service

THE telephone executive, therefore, in making sure that the cost of TRANSMISSION POWER per subscriber's station per year is not excessive in his local battery offices, will be justified in so framing his purchasing specifications for dry batteries as to secure:

A.—Long Continued Sustained Voltage under Service Conditions.

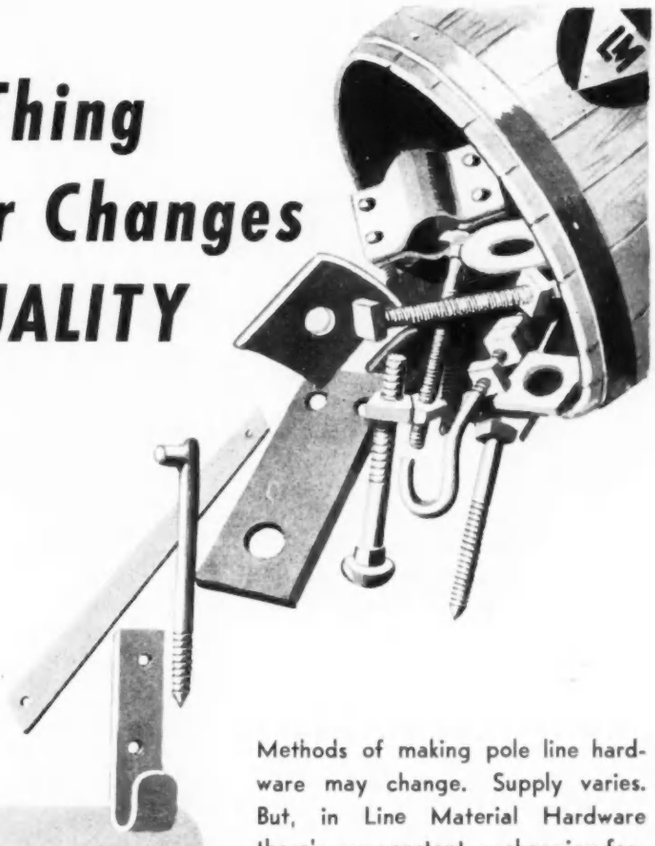
B.—Moderate Output in Amperes when connected in the typical circuit including the transmitter, primary of the induction coil, wiring and battery.

C.—Relative freedom from local action during periods of idleness.

The slightest consideration of these three desirable characteristics of dry cells for telephone service indicates very clearly that a different and special type of cell is suitable for telephone service than, for illustration, the type of cell which is designed primarily for use in ignition. It is perfectly feasible for the manufacturer to control the features of design and the process of manufacture so that, within reasonable limits, his finished product will exhibit the desired charactertistics. It is for this reason that operating telephone companies should, if possible, supply dry cells bought under their own specifications to all subscribers, both those owned and those switched, served by their switchboards. This is desirable in order to avoid the use of dry cells having the same standard external appearance as the

(Please turn to page 84)

One Thing Never Changes ...QUALITY



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Nowadays that's particularly important. Why? Because that consistent high quality that's built into L-M products cuts down on replacements. It helps save metal by doing so . . . it helps save machinery . . . it helps save labor.

Quality isn't something new to Line Material Hardware . . . something that grew out of circumstances that make extra care necessary. It's something that's been in every piece of L-M Hardware for over 30 years . . . anchor rods, bolts, clamps, guards and all the other members of that big, famous family.

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Highlights of the Communications News

(Continued from page 41)

lines were among the most important subjects before the committee. The new and revised orders of the Communications Branch (L-148 for manufacturing, the strengthened L-50 telephone service limitation regulations, and the improved maintenance-repair-operating P-130) were also under consideration.

Long Distance Priorities

THE plan for priorities for long distance telephone calls of an urgent nature to be instituted to give the armed forces, important government agencies and officials, and war production industries the right of way on the toll lines is the latest move to concentrate the telephone service at its highest efficiency for war effort activities. This plan which has been formulated jointly by the Board of War Communications, WPB Communications Branch and telephone industry was understood to have been nearing final approval and promulgation by the BWC as the TELEPHONE ENGINEER went to press.

Civilian telephone service, at the same time, faces further inroads from normal usage as shortages of facilities

J. R. Porter, member newly appointed Telephone Operations Industry Advisory Committee.

and materials and metals for extension of the plant grow. In highly critical areas where local exchange telephone plant becomes tighter in capacity, telephones of non-essential civilians, both in business and residential areas, may be rationed even to the extent of removing telephones from homes of subscribers where they are already installed. There may be a system of sharing neighbors' telephones. In apartment houses pay stations may take the place of individual apartment telephones as they have already done in a number of critical war effort areas in new apartment buildings erected for war workers. **These are "things to come".**

J. P. Boylan, member newly appointed Telephone Operations Industry Advisory Committee.

Telegraph Troubles

THE telegraph service has already undergone an examination of its troubles in handling the tremendously increased record communications traffic. The FCC is now preparing a report and recommendations on the ills of the Western Union and Postal Telegraph—mainly "labor" pains—under war conditions. Asked by the Board of War Communications to make the survey, the FCC is said to have found that the rather high rate of turnover of employees due to the attraction of higher wages in war production industries was the major problem of the industry which because of the rigidity of its rates and revenues cannot meet such wage scales, especially in the case of newer employees. Due to shortages of critical metals there are certain sections of the nation where the lack of modern automatic telegraph printer and relay equipment has created a bottleneck, notably on the Pacific Coast.

The House Interstate Commerce Committee is about to complete its drafting of the Western Union-Postal Telegraph merger legislation and, while the election may slow up voting on the measure until after the election, there is a fairly favorable outlook that the measure will be enacted into law before the current session of Congress ends. However, if Congress fails to act during the present session, the bill, which has been passed by the Senate, would have to be reintroduced next year and travel the route all over again through the Senate and the House.

Manpower Situation Still Tangled

THE tremendous demands for the armed forces, which are certain to be drastically expanded during 1943 because of the outlook for an overseas Army of 4,000,000 during next year, are slicing deeply into the industrial manpower—so much so that the armed forces' high command has been willing

B. T. Miller, member newly appointed Telephone Operations Industry Advisory Committee.

Oscar Burton, member newly appointed Telephone Operations Industry Advisory Committee.

Lloyd Wright, member newly appointed Telephone Operations Industry Advisory Committee.

to "stop, look and listen" concerning the impact of the increased draft quotas upon the operations of industrial production and essential services like communications.

The outlook is hard to predict because of the dilatory forming of policies by the War Manpower Commission. In fact, Congress has become somewhat disgusted with the pulling and tugging for position between the War Manpower Commission and other agencies involved in the procurement of industrial labor and now seems willing to give the Selective Service System complete authority on not only its present function of drafting men for military service but also for the operation of the projected National Service Act under which men and women can be ordered into war industries. But don't look for any enactment of this legislation until after the election.

The following are interesting guideposts on the manpower highway:

1. The War and Navy Departments have classified communications, both operating and manufacturing—and the telephone industry in both fields specifically—as "essential activities" and have announced that neither the Army nor the Navy will accept for a commission or an enlistment any "key" civilians from these industries without

(Please turn to page 82)

H. H. Nance, member newly appointed Telephone Operations Industry Advisory Committee.

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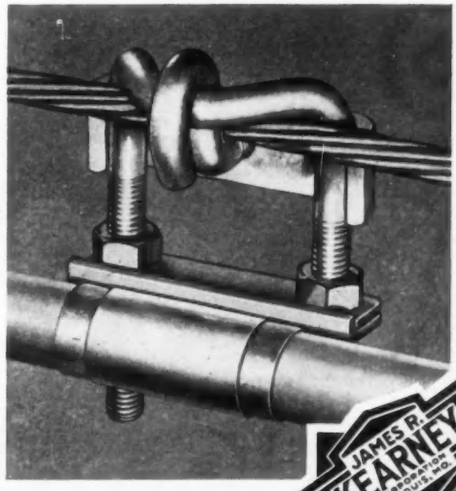

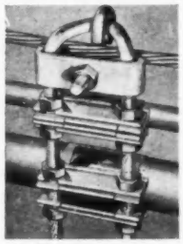

design, for clamping two cables supported on one strand.

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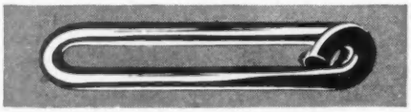
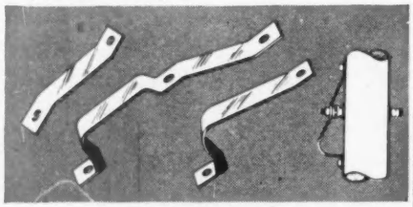
CABLE MATERIALS

Specialized for Telephone Lines

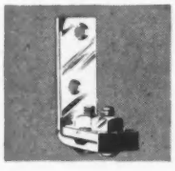
Cable Suspension Clamps are made in two styles—one- and three-bolt. Both will take strands 1/4 to 7/16 inches diameter.



Reinforcing Links relieve side strains at angles in the line. Fastened by lag screws on each side of Cable Suspension Clamps.



Reinforcing and Safety Straps are of three styles: one to support the messenger bolt; one to prevent the Cable from pulling; one a combination of the other two.



The curved groove of the Universal Messenger Hanger allows it to be used at corners as well as on straight runs. Forged from 1/2 x 2 inch open hearth steel.

Shown above are some of the more popular Oliver Cable materials. Forged from mild open hearth steel, they are accurately made, sturdy, dependable. All items are protected by a heavy hot dip galvanizing coating.

OLIVER IRON AND STEEL Corporation
Makers of Pole Line Hardware Since 1894
PITTSBURGH, PENNSYLVANIA

H. S. Dumas, member newly appointed Telephone Operations Industry Advisory Committee.

first obtaining a written release from the heads of the industry. Key civilians included executives, heads of major divisions or departments or principal subdivisions and technical experts. The Selective Service System will also have to release civilians from these essential industries who are outside these categories before the Army and Navy will accept them.

2. Women employees in semi-skilled and skilled mechanical and technical occupations will have to be increased in large numbers. The War Manpower Commission is now conducting tests of feminine laborers to withstand the heavier types of work at the Aberdeen, Md., Ordnance Proving Grounds so that they can be assigned to tasks where their health will not be injured.

3. The Board of War Communications is now finishing the long, long trail of its studies on labor shortages, based on questionnaires to several thousand telephone companies, and on the definitions of essential occupations which were compiled by the BWC technical committees of the industry. The results of these studies are expect-to be most useful in gauging just how far the drain for military service can go on the telephone industry's manpower without jeopardizing the efficacy of the service.

Employees Exempted from Presidential Sunday Pay Ban

SECRETARY of Labor Frances Perkins has exempted employees of telephone operating companies from the Presidential Executive Order eliminating differential pay for Sunday and holiday work in a ruling issued Oct. 3. Telephone manufacturing companies' employees, however, are NOT EXEMPTED.

This means that telephone employees in the Bell System, particularly, will continue to receive their extra pay differential for Sunday and holiday work. This extra pay amounts to about $12,000,000 a year and has been a tradition in the Bell System for more than a quarter century.

(END)

Want Telephone Exchange!

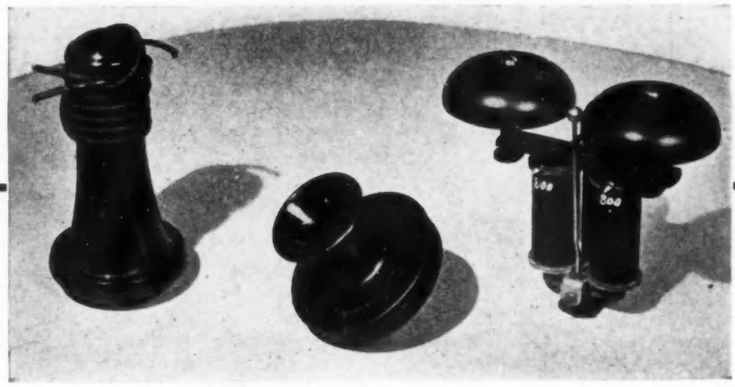
Mrs. Harry Momyer, operator of the Ensign, Kan., telephone exchange involved in a many year controversy, has notified the Kansas state corporation commission she had not received any offer to buy her telephone equipment.

Mrs. Momyer said she received a letter from the state corporation commission, saying, "We have a letter from officials of the city of Ensign, stating that you have refused a fair salvage price offer for your telephone exchange."

"I have not had any offer at all," Mrs. Momyer said.

Mrs. Momyer said she has offered all the equipment of the exchange for $500, and lists a switchboard, 24 telephones, 27½ miles of good wire, 278 poles, good and bad, a 50-pair protector, a 50-pair main frame, 100 insulators and various other items.

John Rees, member newly appointed Telephone Operations Industry Advisory Committee.



Suttle Remanufacturing Is *Practical* War Aid!

With all the operating limitations brought about by war, the practice of using Suttle Remanufacturing Service for maintenance, repair, and upkeep of subscriber equipment is more vital than ever. This type of service is distinctly authorized by WPB, and materials have been made available to maintain Suttle service at regular standard.

Most of Suttle's male employees are men with families —our wages are high — so the same old crew with the "know-how" are still on the job. Therefore, you can count on the same dependable service you have always had from Suttle.

This Suttle service does a big job of conserving critical war materials. Regular use of it will "keep 'em talking" at ideal standards. It is a practical aid toward winning the war.

For Top Quality Send Parts to:

SUTTLE EQUIPMENT CO., LAWRENCEVILLE, ILLINOIS

Telephone Engineer

HANDBOOK TABLES

By B. C. Burden

Date—October 15, 1942
Index—General

General

The following electrical formulas are used to compute the relationship between voltage, current, resistance, and wattage are the most useful of all electrical equations.

Ohm's Law Formula

$I = \frac{E}{R}$ Divide potential in volts by resistance in ohms to get current in amperes.

$R = \frac{E}{I}$ Divide potential in volts by current in amperes to get resistance in ohms.

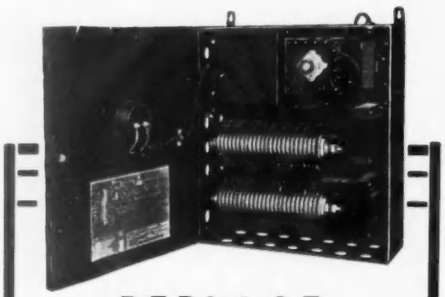
$E = IR$ Multiply current in amperes by resistance in ohms to get potential in volts.

Power Formula

$P = IE$ Multiply current in amperes by potential in volts to get power in watts.

$I = \frac{P}{E}$ Divide power in watts by potential in volts to get current in amperes.

$E = \frac{P}{I}$ Divide power in watts by current in amperes to get potential in volts.



REPLACE
YOUR BATTERIES
with ELECTROX
RECTIFIERS

• Supplies DC power for all types of telephone equipment.

BATTERY ELIMINATORS — with or without power-off relays for magneto operators' sets.

BATTERY ELIMINATORS—with constant voltage output for PAX and PBX, with or without sub-cycle ringer.

BATTERY CHARGERS — for trickle charging telephone batteries.

AUTOMATIC BATTERY CHARGERS — for exchange batteries.

Write for Additional Information

SCHAUER MACHINE CO.
2064 Reading Rd. Cincinnati, Ohio

Transmission Power In Local Battery Systems

(Continued from page 78)

proper batteries but designed and suitable for some other type of service. Inducements may well be made to switching subscribers, particularily, to encourage them in obtaining their replacement dry cells from the stock of the telephone company rather than from some entirely unrelated source. In general because the service demanded of the dry cell in telephone service is intermittent and because it operates in a circuit of practically constant resistance when not idle it will be found, when the proper type has been used, that the total chemical energy of the cell is practically used up when the voltage curve has dropped to the point where experience has shown that the cell should be replaced. This quality is one which can be absolutely controlled by the design and process of manufacture and will be found to be a requirement which may be embodied, with confidence, in the specifications under which dry cells are to be purchased for telephone use.

Testing

DRY cells can, of course, be tested to ascertain their operating characteristics and value under any given set of conditions. Such tests are tedious and require constant and undivided attention as well as careful consideration of the conditions which the dry cells are to meet. Reputable manufacturers will always be glad to cooperate with the telephone companies in making such tests unless it happens, which is very likely and probable, that the manufacturer has previously made precisely the required test. In such cases the test results may well be demanded before the purchase order is placed. The point to be emphasized is that **telephone service dry cells are of a special type** and that that type should be used in the average installation where the conditions as to usage are about normal.

Conclusions

THE preparation of specifications for the purchase of dry cells for telephone service in local battery systems is of great importance to the operating executive. It is important, in the first place, because the installation of the proper type of dry cell will eliminate many transmission failures and reduce the frequency of battery renewals thereby effecting notable economies in the cost of TRANSMISSION POWER. The annual cost is affected because battery failures and renewals impose on the telephone system not only the cost of the actual batteries required for renewal but also the collateral cost of labor, automobile expense and lost revenue due to possible service interruptions in many cases when, with the use of the proper type, such costs might not otherwise be incurred.

(END)

ESTWING
UNBREAKABLE
TOOLS

ONE-PIECE STEEL HEAD
—HANDLE WITH NON-SLIP
GRIP OF SOLE LEATHER
WASHERS

SAFE

You Can Swing with Confidence

The head of your Estwing Hammer won't fly off because this tool—like every other Estwing Tool—is forged from a single piece of steel.

Available in two attractive finishes —High Polish and Velvet Black.

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AUTOMATIC ELECTRIC
SALES COMPANY

1033 WEST VAN BUREN STREET • CHICAGO, ILLINOIS
BRANCH WAREHOUSES AT DALLAS, KANSAS CITY, LOS ANGELES, RICHMOND (VA.) AND SAN FRANCISCO

Exchange Building Destroyed By Fire

The New Madrid, Mo. exchange of the Southeast Missouri Telephone Company was destroyed by fire early in September. Leslie Pate, wire chief of the company, announced that the fire started from an oil stove. Service was restored immediately.

Purchasing Officers Needed For Civilian War Service

The enormous expansion programs of Government establishments vitally connected with the war effort have vastly increased the volume and importance of the work of the Government Purchasing Officers. In order that Government establishments may operate at maximum capacity, it is imperative that Purchasing Officers be recruited who are skillful, resourceful, and far-seeing.

Purchasing Officers are now being sought for positions which pay from $2,000 to $4,600 a year. They will prepare specifications for the purchase of government supplies; prepare invitations to bid, and maintain current information with respect to market trends, fluctuations, sources of supply, and laws and regulations pertaining to Federal procurement.

The civil service examination announced for filling these positions calls for persons who have had from two to six years of responsible experience as purchasing or procurement officer handling large lots of materials of considerable variety. This experience may have been acquired with a large railroad, or other public utility, a large industrial or commercial establishment, a branch of the Federal Government or with the government of a State or large municipality.

Applications are not sought from persons engaged in war work unless a change of position would result in utilization of higher skills possessed by the applicant. In keeping with War Manpower Commission policy, individuals engaged in any production and maintenance occupations in non-ferrous metal mining, milling, smelting and refining, and logging and lumbering industries in the critical labor area which includes the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming, cannot be considered for appointment in the Federal Government unless a certificate of separation from the United States Employment Service has been obtained by the Civil Service Commission.

There are no age limits for this examination. No written tests are required. Applications will be accepted until the needs of the service have been met. Announcements and application forms may be obtained at any first or second-class post office or from the Civil Service Commission, Washington, D. C.

SAVE TIME — REFER TO
TELEPHONE ENGINEER'S BUYER'S GUIDE

TELKOR, Inc.

Extends its best wishes to every member of the United States Independent Telephone Association and hopes its

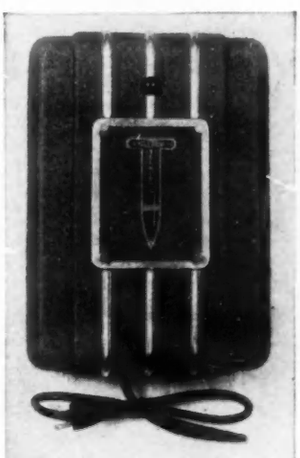
46th ANNUAL MEETING

will be the best ever

WHILE "all out" war work in cooperation with our National Government is taxing our production—We are proud we have been able to continue to make satisfactory deliveries to our government and to our many customers in the telephone field.

TELERING

Reliable ringing service is essential in providing satisfactory telephone service.



Directly converts Commercial Alternating Current to Telephone Ringing Current—Current Consumption Negligible—Positively NO radio interference.

Use TELERING and provide the MOST reliable service at the LEAST cost.

Order through your jobber or direct from

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ELYRIA, OHIO

Progress of the Signal Corps

(Continued from page 42)

neers from both services, who speed up production of vital communications apparatus and equipment through aid to manufacturers in allocation of strategic materials and in solution of other production problems. The functioning of the production expediting specialists was originated a year ago by the Signal Corps.

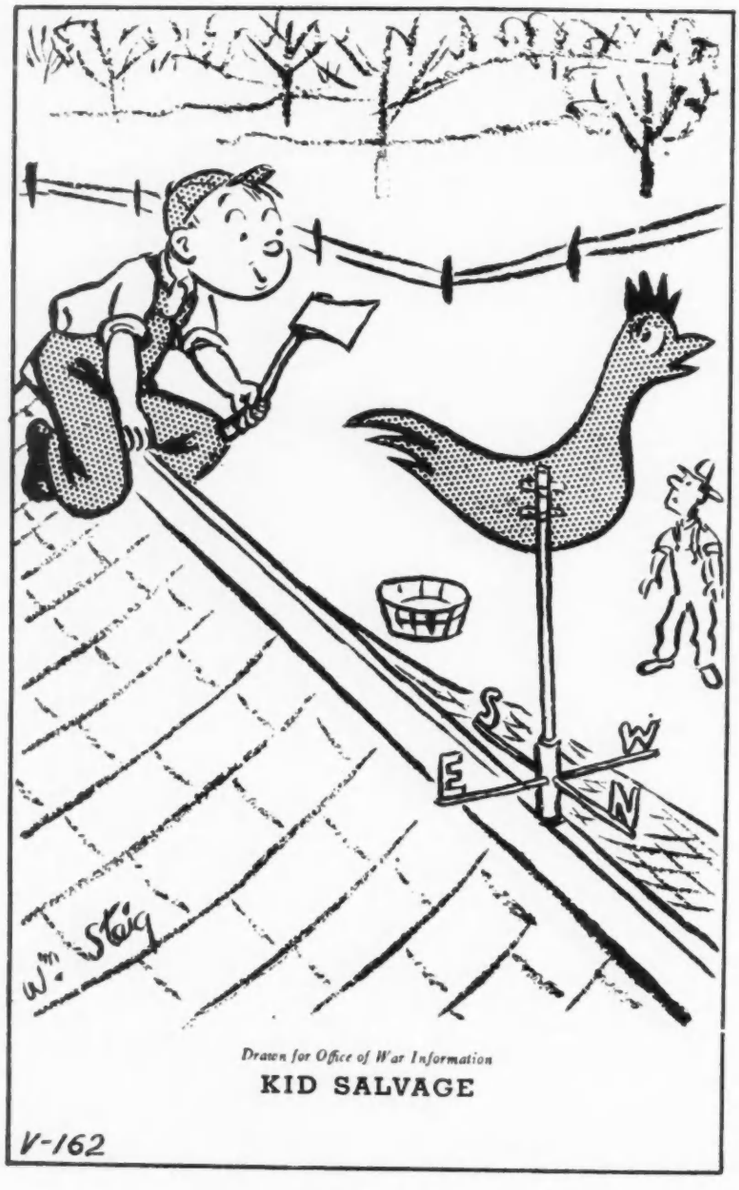
DURING the first year of his service as Chief Signal Officer—which started Aug. 4, 1941, as Acting Chief Signal Officer, until the tour of duty of his predecessor expired on Oct. 1—General Olmstead spent his main efforts in expanding and speeding up the operational and functional activities of the Signal Corps. He particularly emphasized the overnight tremendous growth of the Signal Corps in its role of the communications equipment supply branch of the Army, its training and enrolling of specialized personnel to operate the Army's communications facilities and the highly important communications message center and network, so vital to the Army's command to link it with the far-flung military activities throughout the world.

The chairmanship of the two Boards places General Olmstead in a role of outstanding responsibility in his function as the communications advisor to the American Army General Staff as the Chief Signal Officer of the Army. In addition to heading these two Boards, General Olmstead is the War Department representative and Vice-Chairman of the Board of War Communications, the five-department agency which formulates plans and policies for the coordination of the civilian communications systems in the war activities and effort.

The mission of the Chief Signal Officer summarizes succinctly the functions of the Signal Corps in the Army. It reads that "in addition to the primary responsibility of the Signal Corps as the communications agency of the Army, for military signal communications, it is the responsibility of the Office of the Chief Signal Officer to assure the supply to the Army of such equipment and supplies as are assigned to the Signal Corps for procurement in such quantities and at such times as are required to meet the Army Supply Program and other directives of higher authority; and to train and furnish specialized Signal troops and units to the Army Air Forces, the Army Ground Forces, the Services of Supply and to elements of the field forces." The Chief Signal Officer acts as technical advisor to the Chief of Staff and higher echelons with respect to communications and communications security, Radar, photography and cryptography. He also determines the general communications policies for the Army, including the allocations of radio frequencies, power, types of emission and schedules for radio operations and policies with respect to signal security and cryptographic operations. The Signal Corps supervises the installation, maintenance and operation of all military signal communications systems and equipment, including military cables, telephone and telegraph lines, radio apparatus and stations, fixed airways systems and the operation of temporary systems used by combat troops.

ANOTHER most important function of the Chief Signal Corps is the inauguration and carrying on of development and research of new communications apparatus, equipment and devices—many of them the secret "vital" weapons of the American armed forces. The Corps does this directly through two major laboratories—the Signal Corps Laboratory at Fort Monmouth and the Wright Field, Ohio, Laboratory for aeronautical communications development—but there are many other research projects being completed and carried on in the Signal Corps' experimental tank communications installations in the west, the Radar installations and in the laboratories of the major communications companies, such as Bell Telephone Laboratories, RCA Laboratories, General Electric, etc.

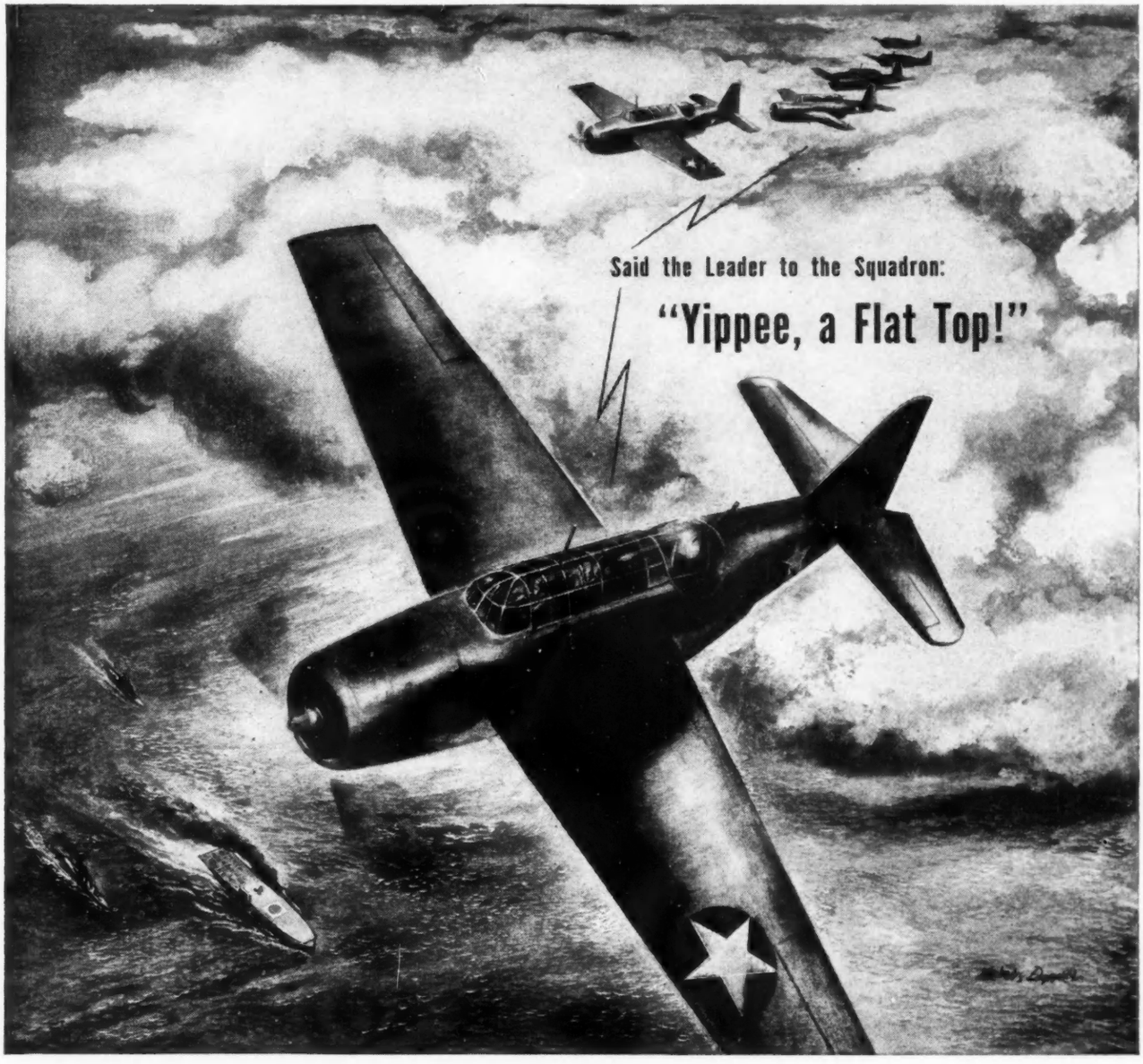
Much of the credit for the smooth



Drawn for Office of War Information

KID SALVAGE

V-162



They work together better . . .
because they can talk together

In both the Coral Sea battle
And at Midway,
The Japs were robbed of a sneak attack
By scouting U. S. fliers,
Who reported back by radio.

Then Uncle Sam's carrier-based planes,
And land-based bombers
With perfect team work
Plastered the Jap task forces . . .
Giving special attention to
The enemy carriers.

And over the radiotelephones
Of our planes and ships
Came the phrase, "Scratch one flat top!"

The young American fliers
Were telling the world
Another Jap carrier
Had gone to the bottom!

Modern communications equipment
Designed and manufactured
By I. T. & T. associate companies
Is helping Uncle Sam
Coordinate his fighting forces
On land, sea and in the air.

The broad peacetime experience
Of I. T. & T.
In the field of communications
Is proving its value in time of war.

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION *67 Broad St., New York, N. Y.*

IT&T

Associate Manufacturing Companies in the United States
International Telephone & Radio Manufacturing Corporation
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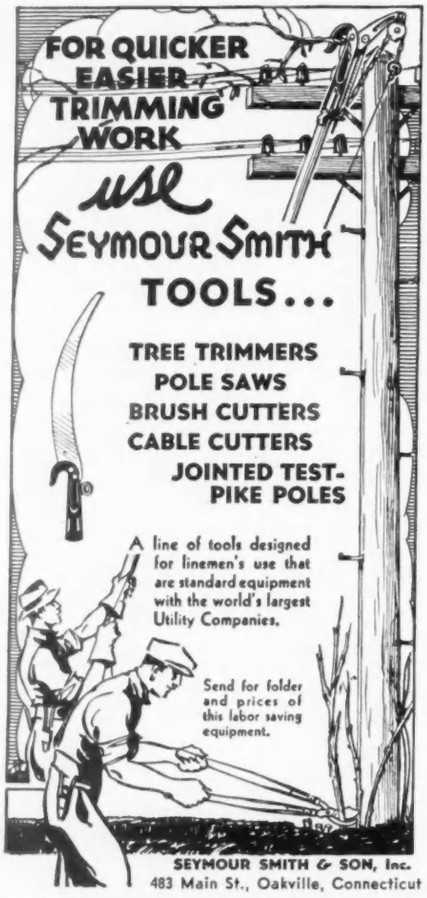
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use SEYMOUR SMITH TOOLS...
TREE TRIMMERS
POLE SAWS
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A line of tools designed for linemen's use that are standard equipment with the world's largest Utility Companies.
Send for folder and prices of this labor saving equipment.
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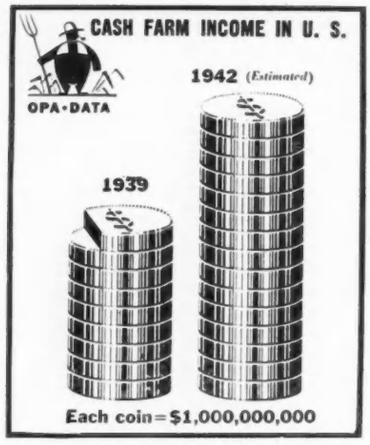
functioning of the Signal Corps and its farsightedness in the formulation of policies to prevent errors and problems arising out of the many-sided functions of the Corps during the past year of expansion belongs to Brigadier General James A. Code, Jr., the Deputy and Assistant Chief Signal Officer. General Code in handling the many operational administrative and executive functions of the Signal Corps might be likened to an executive vice president of one of the major industries of the country. He played the leading role in the formation and launching of the Signal Corps' Executive Control Division, an agency which keeps a continual check on the expansion of the Corps' functions of procurement, training, and other activities, and acts as the "trouble shooting" medium to remedy problems as they were anticipated or arose. The functioning of this Division has become a model which has been adopted by other branches of the Army. Colonel C. O. Bickelhaupt, former Vice President of the American Telephone and Telegraph Co., now on active duty, heads this Division.

The importance of the Signal Corps as the communications branch of the Army is demonstrated in the role which it plays in the command medium of the Army's General Staff. The Signal Corps has been fittingly described as the "telephone and telegraph and radio system of the Army" and through its communications systems are conveyed all messages from the topmost command of the Army all the way down to the various echelons of the service. This means the procurement, installation, maintenance and, in many cases, the operation of the communications mechanisms used in the Army airplanes, Army tanks and between headquarters and most advanced outposts of the Army. **The Signal Corps' communications system today is undoubtedly the most comprehensive and largest wire, radio and cable military communications network in the world** and is actually the "nerve center" of the Army.



While the procurement of the tremendous quantities of wire and radio communications apparatus and equipment was the tremendous goal emphasized during the last year—and full efficiency and speed has been achieved in that field—the Signal Operating Services of the Corps, in which most notable progress has been made in the past year, are even more important today to exemplify the Signal Corps in its operational and combat functions besides its task of supplying communications equipment to the entire Army. This has meant the training of scores of thousands of officers and enlisted men and to illustrate the breadth of this task, for officers alone there are 120 different general catagories and 74 subtypes. The Signal Corps at its major schools——Fort Monmouth, N. J., Camp Crowder, Mo., Camp Murphy, Fla., and Camp Kohler, Cal.—is not only giving officers and enlisted men specialized training in military communications but is also instructing them in unit functioning for combat operations. There are also specialized training courses for the Signal Corps being conducted in many civilian technical schools, by Bell System telephone companies, by telephone and radio manufacturing companies and officers' courses by General Electric, Cruft Laboraory at Harvard University and the Massachusetts Institute of Tech-

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Bring the Family
Yes sir! Next trip to Fort Worth bring along the wife and kids. A big outing for all of them—plus the thrill of stopping at Fort Worth's homefolks' hotel. Spacious, comfortably furnished, air-conditioned rooms; shower and tub baths. Featured dining service. Popular coffee shop. Centre of Fort Worth's theatre and down-town shopping district. . . . Next trip to Fort Worth combine business with pleasure. Bring the wife and kids and stop at
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TRUE WESTERN HOSPITALITY
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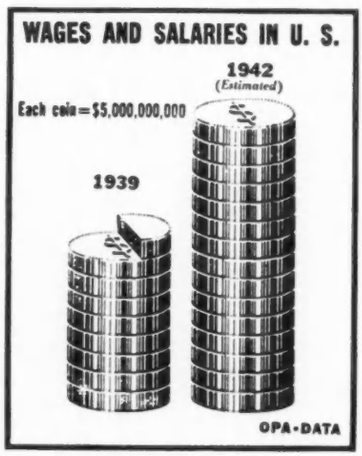
IN THE HEART OF FORT WORTH'S THEATRE AND DOWN-TOWN SHOPPING DISTRICT

nology. In addition, the Signal Corps is aiding in the training of the Women's Auxiliary Army Corps (WAACs) and has enrolled and supervised training of thousands of civilian men and women communications operating and manufacturing specialists in approximately 200 trade schools.

THE Signal Corps officers and soldiers are now on every overseas front. It is the function of the Signal Corps as an operational branch of the Army to install, maintain and operate all communications facilities down through the Divisions. Below the Divisions of the Army the communications is provided and maintained by the Signal Corps but in general not operated by Signal Corps troops. But the officers and enlisted men in communications of the other combat arms of the Army, whether Air, Armored or Ground Forces, have been trained in their functions generally through the basic instruction doctrines, principles and procedures which were formulated by the Signal Corps. In peacetimes the Signal Corps at its Fort Monmouth School usually trained the communications personnel of the other branches of the Army, but now due to the Signal Corps' own tremendous load of procuring and training officers and enlisted men the Corps' Schools are now almost entirely devoted to training of its own personnel. To illustrate the tremendous growth of the Signal Corps it is at present larger than the normal peacetime entire Regular Army. The activities of the Corps in training, personnel and operations are now headed by Brigadier General C. M. Milliken.

The Army Communications Service, directed by Brigadier General Frank E. Stoner, who is the alternate to General Olmstead on the Board of War Communications, operates the highly important Army Message Center which is the contact of the War Department with the forces throughout the country and overseas. The flow of communications traffic through the War Department Message Center, during the past year, has increased eight or nine times in wordage. In addition, the Army Communications Service handles the plant facilities arrangements for communications at the Army camps, bases and other posts. It also has the function of maintaining close liaison with the communications companies.



The Signal Corps' communications service for the purposes of command and maintenance of communications between all branches of the Army in the United States and its territories and possessions and with the overseas fighting fronts is prepared to meet any exigency and demands. It has been notable that the Signal Corps has established communications links, both through its own wire, radio or cable facilities or using commercial communications systems generally as alternative routes, to all fronts ahead of actual requirements and even before any fighting occurred in those theatres of war. The newest and most modern developments and devices in communications are being utilized, including high speed radio, facsimile and wire and radio telephoto, with the aims of the Corps' Army Communications Service being the greatest speed and best accuracy.

From the standpoint of appropriations —and also of the vital need to supply the Army's requirements as well as the necessities of the Allied Nations' forces —the six billion dollar task of the Signal Supply Service of the Signal Corps, directed by Major General Roger B. Colton, has been a most tremendous assignment. "No grass has grown under the feet" of the Signal Corps in pushing this program to full-speed functioning—and the proof is shown by the fact that more than $3,000,000 worth of communications equipment is being accepted daily by the Signal Corps, twenty times as much as a year ago.

To accomplish this result there has been a multi-faceted effort. First, the radio manufacturing industry had to be expanded many-fold to absorb a production load far beyond imagination in comparison with its peacetime activities. The telephone manufacturing industry was more easily geared for the production load although it, too, had to be expanded substantially. The complete revamping of the radio manufacturing industry was aided through a number of activities inaugurated by the Signal Corps, working closely with the WPB.

FEATURE phrases of the procurement program of the Signal Corps have been the production expediting activities through which critical materials, tools, etc. have been brought speedily to manufacturing plants on rush contracts; the aid in substituting strategic materials and metals; and the savings by the com-

DAN'L H. McNULTY

Conducts

A MARKET PLACE for listing supplies that are wanted . . . or disposing of equipment or supplies of any kind that may be used by other Independent telephone companies . . . or *for reducing surplus inventories.*

The use of this space is open to anybody and everybody in the Independent Telephone business.

Make available to others whatever you have that you cannot use yourself.

FOR SALE

1 Telering Model X
1 New WE cordless magneto P.B.X. 10 lines 5 trunks
2 Carrying hooks with 5 foot handles
Kellogg No. 259 Switchboard jacks 10 per strip
No. 16 Toll Line Glass Insulators
No. 9 Exchange Line Glass Insulators
Galv. Guy Hooks
Galv. X-Arm Braces—20", 24" & 28"
Galv. 5/8" X-Arm Bolts—10", 12", 14", 16", 18" & 20" long
Galv. 5/8" x 16" Eye Bolts
Galv. 2¼" x 2¼" x ¾" hole Square Washers
Galv. 3 Bolt Clamps (½" bolts)

WANTED

Stromberg No. 130 jacks on No. 81 mountings
Stromberg No. 121 lamp sockets on No. 81 mountings
Chicago Telephone Supply Co. 5 bar generators
Chicago Telephone Supply Co. switch board drops
Kellogg desk stands both local battery and common battery
Complete Magneto Telephones or Parts
Western Electric or Kellogg transmitters—either grounded or metallic style
Reusable Iron Wire
5/8" Nuts only for Thru Bolts
Lineman's Portable Test Sets
Cable Testing Sets
Small Common Battery Switchboards

Address all mail to:

DAN'L H. McNULTY
TELEPHONE REPAIR CO.
Rogers Park Station Chicago, Illinois

PROTECT CASH— SPEED UP COLLECTIONS

CHANGE TO THIS SELF-LOCKING COIN BOX

No. 6001-B

The coin opening in the cover locks automatically when the box is removed from the pay station. Collector handles no money. He merely inserts an empty box which has had the cover sealed in place at the company office and is on his way.

This coin box is used regularly in hundreds of thousands of pay stations throughout the country, and it is

ALMOST A "MUST" RIGHT NOW

when help is short and those remaining must often double up on the work—or where untested substitute collectors are inducted into service.

Available in two sizes, 6001A and 6001B—either one interchangeable with our standard 2A open-type receptacle.

NOTE—The Government's 6% excise tax is NOT assessed on unattended pay station calls.

AUTHORIZED AGENTS

American Automatic Electric Sales Co.
Graybar Electric Company
Kellogg Switchboard & Supply Company
Liech Sales Corporation
The North Electric Mfg. Company
Stromberg-Carlson Telephone Manufacting Company
Canadian Telephone & Supplies, Limited
Northern Electric Co., Limited

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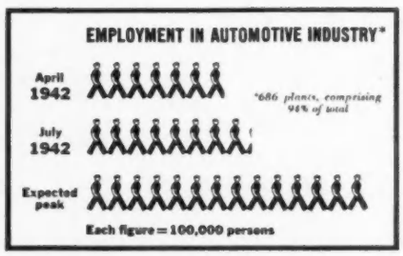
munications manufacturing industry, aided by the Signal Corps, of thousands of tons of critical materials. Through foresight of the trends in the procurement of the billions of dollars worth of equipment needed by the armed forces, the Signal Corps anticipated the necessity for the renegotiation of communications apparatus contracts with the manufacturers, particularly in the case of the specialized new equipment, necessary for modern mobile warfare. As a result through voluntary negotiations with manufacturers the Signal Corps has, during the past year, secured reductions, amounting to approximately eighty millions of dollars, in equipment contract prices. Much of the effective work in this latter direction was achieved through the establishment of a comprehensive cost accounting system, which was put into effect by Major General Olmstead, and which included the formation of a unit of approximately 50 expert accountants selected through the aid of the Federal Reserve System. In addition, the Chief Signal Officer established a completely up-to-date business machine records unit so that the records of production, contracts, costs, and other pertinent data could be maintained accurately and speedily.

Besides the procurement functions in the Office of the Chief Signal Officer, the Signal Corps has its important Supply Depots of which the Philadelphia Signal Depot, headed by Brigadier General A. A. Farmer, with its staff of 10,000 to 12,000 persons, which includes the eastern half of the country, is the largest. The aviation radio needs are covered by Wright Field, Dayton, O., and the western half of the country by another Signal Depot. Of vast importance to the Army's activities are the approximately 100 strategically located Signal Corps maintenance and repair depots throughout the United States, so that a minimum of time and transportation is consumed in dispatching for reconditioning wire and radio equipment from Army units in the field.

The Signal Corps also has a valuable function of directing all ground photographic activities of the Army. This means that its photographers are attached to the overseas fighting units of the Army and transmit to the United States photographic scenes of action.



But that is only part of its job in this field, as the Signal Corps furnishes all the training films for the Army. To illustrate the load of that latter assignment, the Signal Corps Photographic Branch has at all times 125 training films in production—and it takes about two weeks to produce a training film.

South Carolina Convention

According to the announcement of Frank S. Barnes, president, the South Carolina Independent Telephone Association convention will be held for one day only, Nov. 3rd, at the Andrew Jackson Hotel in Rock Hill, S. C.

THE Corps to do this work took over the old Paramount Studios on Long Island, N. Y., a seven or eight million dollar plant with the largest sound stage in the world. The training films are mainly secret as they are produced to teach the best military techniques of the various forms of modern warfare. Some of the best talent of the motion picture industry in Hollywood has entered the Signal Corps to aid in photographic activities, including Colonel Darryl Zanuck and Lt. Col. Frank Capra.

In the Signal Corps communications functions approximately 99% is in electrical communications, wire and radio; but carrier pigeons, too, are being trained and used, and the large unit of commissioned and enlisted personnel as pigeoneers. For message work where pigeons are only available there has been a considerable amount of secret training, including two-way flight and night flying. The pigeon training activities have been moved from Fort Monmouth to Camp Crowder.

The great problem which faces the Signal Corps today is the enrollment of competent manpower—men who know something about electricity, radio and telephony—and this applies not only to men in uniform but for civilian personnel since the Corps needs approximately 50 civilians for every hundred men in uniform. For its Army operational functions the Signal Corps furnishes battalions, companies and detachments for every combat arm of the Army. These Signal Corps troops operate the communications—telephone, wire, telegraph, teletype, and radio—for these arms of the Army up to Divisions. In addition, there are Signal Corps supply depot units which supply the combat forces with apparatus and equipment, and detachments to maintain and repair the communications facilities of all combat forces on the fighting fronts and in the rear zones.

I.T.&T. to Build New Factory

The International Telephone and Telegraph Corporation, announces plans to proceed promptly with construction of the first unit of a new factory to be located in New Jersey, which will eventually become the home of I.T.&T.'s research and manufacturing operations in the United States. The site selected for the project consists of approximately 125 acres in Nutley and Clifton. It is regarded as a very desirable location for a highly skilled process such as telephone and radio manufacturing and is also an especially suitable location for laboratories engaged in telephone and radio research.

The factory will be constructed in units following a fundamental plan which provides great flexibility for expansion. Each unit will be self sufficient and yet will be so designed as to be coordinated with the other units to form an efficient and modern plant.

As the opportunity arises to enlarge the factory, I.T.&T.'s plan is to ultimately transfer all or most of its American manufacturing and its extensive research laboratories to the new site. At the present time the manufacturing activities of the Company's subsidiaries in the United States occupy more than 800,000 square feet of space, mostly rented, and employ approximately 5,500 persons.

Other subsidiaries of I. T. & T. have long been among the largest manufacturers of telephone, telegraph, cable and radio equipment throughout the rest of the world, but the development of I.T.&T.'s manufacturing in the United States has come largely since 1940. Established primarily to supply the telephone and radio needs of Latin America, the factories and laboratories controlled by I. T. & T. in this country have fitted into the war program in a timely manner.

Early in 1941, I. T. &.T. organized International Telephone & Radio Manufacturing Corporation and established a telephone and radio factory and laboratories, and in June, 1941, the latter company acquired control of the Federal Telegraph Company, an important producer of radio equipment and radio transmitting tubes. These two companies are soon to operate under one name, Federal Telephone and Radio Corporation which will head up all I.T.&T. manufacturing and research operations in the United States.

In addition to its manufacturing companies, I. T. & T. subsidiaries operate the principal telephone systems of Argentina, southern Brazil, Chile, Peru, Cuba, Puerto Rico, and Spain and one of the two large systems in Mexico. They also operate most of the radiotelephone stations and wire facilities which connect the Latin American countries by telephone with each other, with the United States and the rest of the world.

Good Reports

July reports published by three major subsidiaries of American Telephone and Telegraph Company Sept. 3 showed year-to-year profit gains for month as well as for the seven months ended July 16.

Illinois Bell Telephone Company reports net income of $835,824, aganist $726,309 in July, 1941. In the seven months ended July 31, net income of this unit aggregated $6,769,183, compared with $6,696,693 in the corresponding period of 1941.

Bell Telephone Company of Pennsylvania realized a net income of $783,702, compared with $758,911 in the 1941 month. Net income for the first seven months of 1942 rose to $5,937,342 from $5,678,360 a year earlier.

Southern New England Telephone Company closed July buisness with a net income of $268,500, which compares with $258,006 a year earlier. Also increased was the net income for the seven-month period which advanced to $1,911,950 from $1,754,706 reported for the first seven months of 1941.

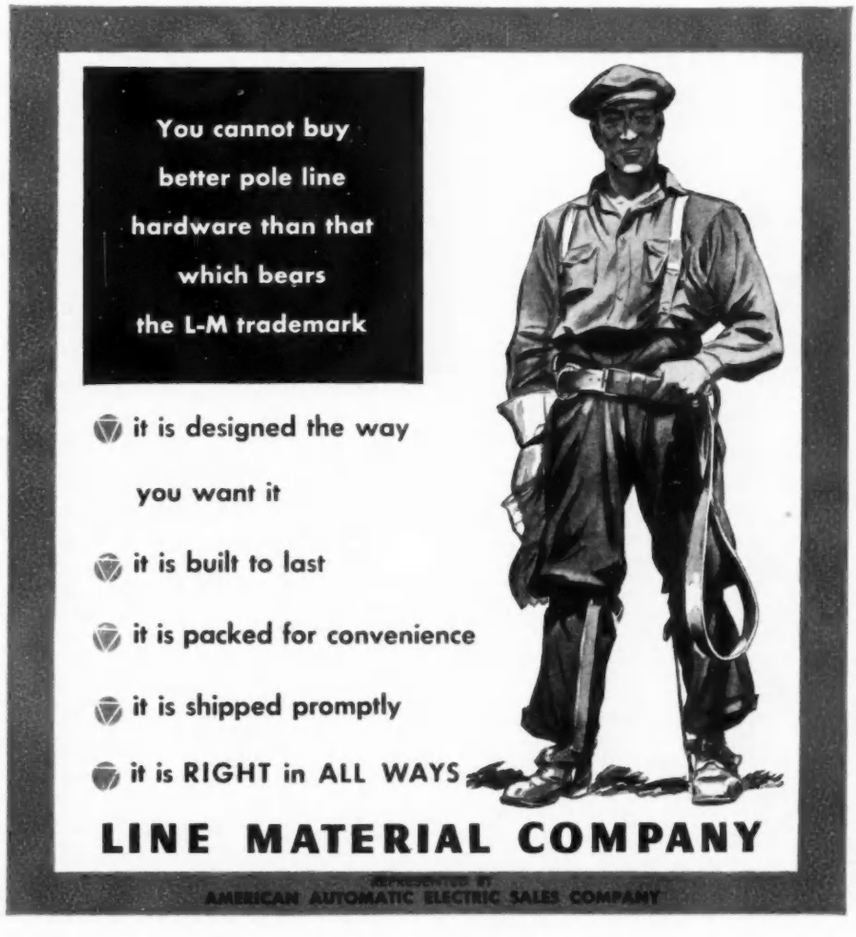
Standard Report

The American Standards Association, 29 W. 39 St. New York, has approved standard methods of testing and tolerances for fabric tubular sleeving and braids. The new standard specifies permissible variations on inside diameter and wall thickness of sleevings and braids, and also governs tolerances as to weight, number of carriers, ends on bobbin, yarn number and imperfections. Testing methods for these factors are specified and referee conditions are set forth in case of dispute.

These standard methods were developed by the American Society for Testing Materials.

Phone Service Changed

Petition to transfer service of the Shady Point Telephone Co. to the Panama Telephone Exchange, discontinuing the Shady Point central office with no change in its rates, was filed recently with the Oklahoma corporation commission. Both are in LaFlore county, Okla.



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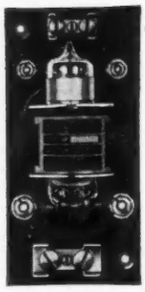
The WAACS and WAVES Have Nothing on WIRES

The Signal Corps, in a small way, now has its own unofficial version of a women's auxiliary corps, appropriately named the WIRES. The WIRES, a group of women attending civilian radio mechanic training courses in Trinidad, Colo., under the supervision of the Signal Corps, skip fancy uniforms—their official garb consists of slacks or shop clothes.

Mail Now!

Almost every Independent telephone company is now represented in the armed forces of our country. Many of them are already on fronts all over the world. The Postoffice Department is now urging that Christmas packages to soldiers be mailed NOW. All of us know how it feels to get packages from home and we urge that you join in by getting your Christmas presents in the mails now while Uncle Sam tells there is still time.

Improved Silent Mercury Plunger Relay



A new mercury plunger relay which may have interesting application in the telephone field is shown in Figure 1. It has been tested to 10 million operations without a failure, and has only one moving part. Rated at 30 amperes, 110 volts 1 H. P., the unit is available for either AC or DC. This relay is available through the H-B Electric Company of Philadelphia.

NARUC Convention

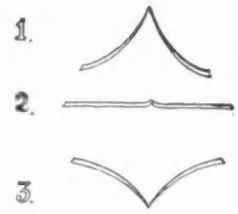
The annual convention of the National Association of Railroad and Utilities Commissioners is to be held in St. Louis with the starting date of the 2½ days sessions starting Nov. 10 at the Coronado Hotel.

The highlights of the convention

(Please turn to page 96)

"It's the Wilkinsons phoning... they want us to come over to see their new tire!"

Make These Cord Tests



Unravel a single strand of tinsel from a telephone cord. Bend it one direction, as in (1), straighten it out as in (2), bend it the other way as in (3). Do this a hundred times and see the effect. See what it takes to break tinsel of different cords. Hang some weights on the strands to see how strong they are. Twist them and untwist them.

Immerse a telephone cord in a jar of water (two competitive cords if you like). Leave them in a week. Check them for shorts with a Wheatstone bridge. Put them back and soak them another week and then check again. See what happens. You'll be surprised to find marked differences in "moistureproofing."

Grab a cord at each end and start sawing across the edge of a rough board with it. Don't use a splintered board that will catch and tear, but just a rough edge that will neatly saw away at the braiding. See how many strokes it takes to fray out the braiding on different makes of cords.

Any telephone man can easily make the above tests and please remember that there is over a half century of experience behind every Runzel cord . . . a modern factory specializing in telephone cords and building them for service and long life . . . all materials rigidly inspected and every individual cord tested for terminal security and ohmic resistance.

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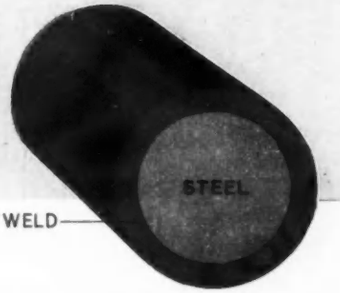

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program, as formulated at present, will be the discussion of the proper relationship between the OPA and the state commissions on the second day and on the final day the important problem of the effect of war taxes on utilities will be studied.

●

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of March 3, 1933,

of Telephone Engineer and Management, published monthly at Pontiac, Illinois, for October 1, 1942.

State of Illinois, County of Cook, ss.— Before me, a notary public in and for the State and county aforesaid, personally appeared Ray W. Smith, who, having been duly sworn according to law, deposes and says that he is the editor of the Telephone Engineer and Management, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc, of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

Editor—Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Business Managers—Ray W. Smith & Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member must be given.)

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4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

RAY W. SMITH,
Business Manager.

Sworn to and subscribed before me this 23rd day of September, 1942.

(My commission expires January 29, 1944)
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W. C. Dillon, right, President of W. C. Dillon & Company, Inc., Chicago, Illinois, points out steadily increasing Dynamometer sales throughout United States. R. E. Dillon, Sales Manager, left, holds shipping papers for largest single Dynamometer order ever placed.

Telephone Books Exempt

Telephone books specifically exempted from existing maximum price regulations applying to the printing and publishing industry, the OPA stated Sept. 24 in a question-and-answer summarization of the regulations' effect. The OPA pointed out that the telephone books usually used by the public are "directories", and thus specifically not under price control rules.

Field Telephone Proves Worth

The value of field telephone communications in a battle was demonstrated in the fighting at the Tenaru River in the Solomon Islands when the Marines annihilated more than 750 Japanese troops. One Marine Second Lieutenant after receiving two wounds gave his orders to his platoon from a field telephone position.

WPB On 6-Day Week

The War Production Board has gone on a full 6-day week for the duration.

The regular office hours of WPB, both in Washington and in the field, now are from 8:30 a.m. to 5:15 p.m. daily except Sunday. However, under the terms of the Administrative order setting up the new system, employes who work on Saturday afternoons are, in accordance with law, granted compensatory leave of four hours to be taken sometime during the next week.

Purpose of the order is to insure that all offices and units of WPB function six days a week, without a let-down on Saturday afternoons.

E. D. Fisher Resigns

E. D. Fisher resigned his position with the Mulvane, Kansas, exchange of the Arkansas Valley Telephone Company on September 1. He originally owned the exchange but in 1929 sold it to Mr. Cales. Since the death of the latter he has been again associated with the company.

Mr. Fisher started in telephone business in 1905 and developed the Mulvane plant from a few subscribers to a 750 station plant. During this time he also worked with the city in the electrical department and spent much time in developing the telephone system in Udall, Kan. He resigned to enter war work in Wichita, Kans.

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Western Elec. No. 317 2 or 3-bar 1000-1600 or 2500 ohm Biased ringer compacts inside connection type $7.00—4-bar with Ind. Mfg. Gen. $8.00—5-bar @	9.00
Western Elec. No. 317 2 or 3-bar 1000-1600 or 2500 ohm Biased ringer compacts outside connection type $6.50—4-bar with Ind. Mfg. Gen. $7.50—5-bar @	8.50
Stromberg-Carlson No. 12606 20 line Fuse rack with Mica Fuses and carbons @	2.50
Western Elec. No. 1269 Arresters with heat coils and carbons 40 lines per bank @	20.00
W. E. No. 1078 type fuse rack 60 lines per bank with fuses @	5.00
Kellogg No. 22 Trans or W. E. No. 329 with back and Mouthpieces @	1.10
Western Elec. No. 323 Transmitters with back and Mouthpiece @	1.25

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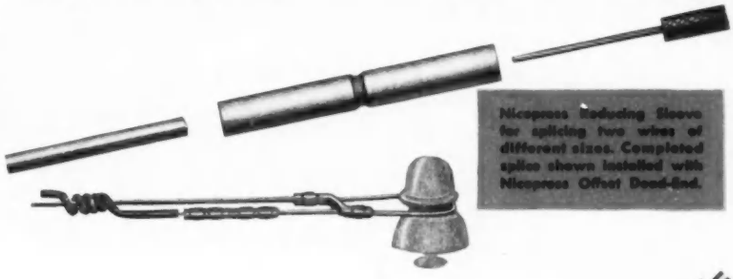
The Nicopress SPLICING METHOD

Nicopress Repair Sleeve for replacing defective joints. Use of this sleeve eliminates cutting in new sections of wire.



Nicopress Reducing Sleeve for splicing two wires of different sizes. Completed splice shown installed with Nicopress Offset Dead-End.

Nicopress Sleeves for splicing Drop, Bridle and Inside wires and completed parallel pair drop wire splice.

Nicopress Galvanized steel sleeve for splicing Galvanized wire and completed splice.

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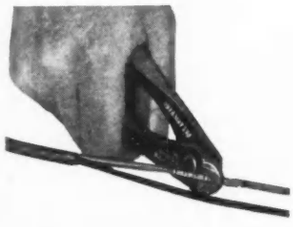
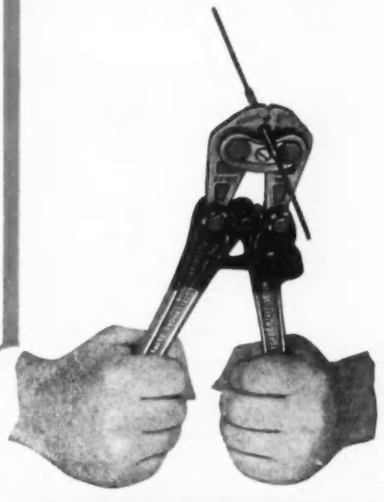
Nicopress copper sleeve for splicing copper line wires and completed splice.



Type No. 17-2 Nicopress Tool. A one-hand-operated tool for compressing sleeve in making Drop, Bridle and Inside Wire splices.



Type No. 31, 2 Grooved Nicopress Tool. Several different wire sizes can be spliced with this tool. Note ease with which sleeve is compressed on conductor.

Nicopress No. 2-102C sleeve for splicing rusty 12 B.W.G. (.109) BB iron wire and completed splice.

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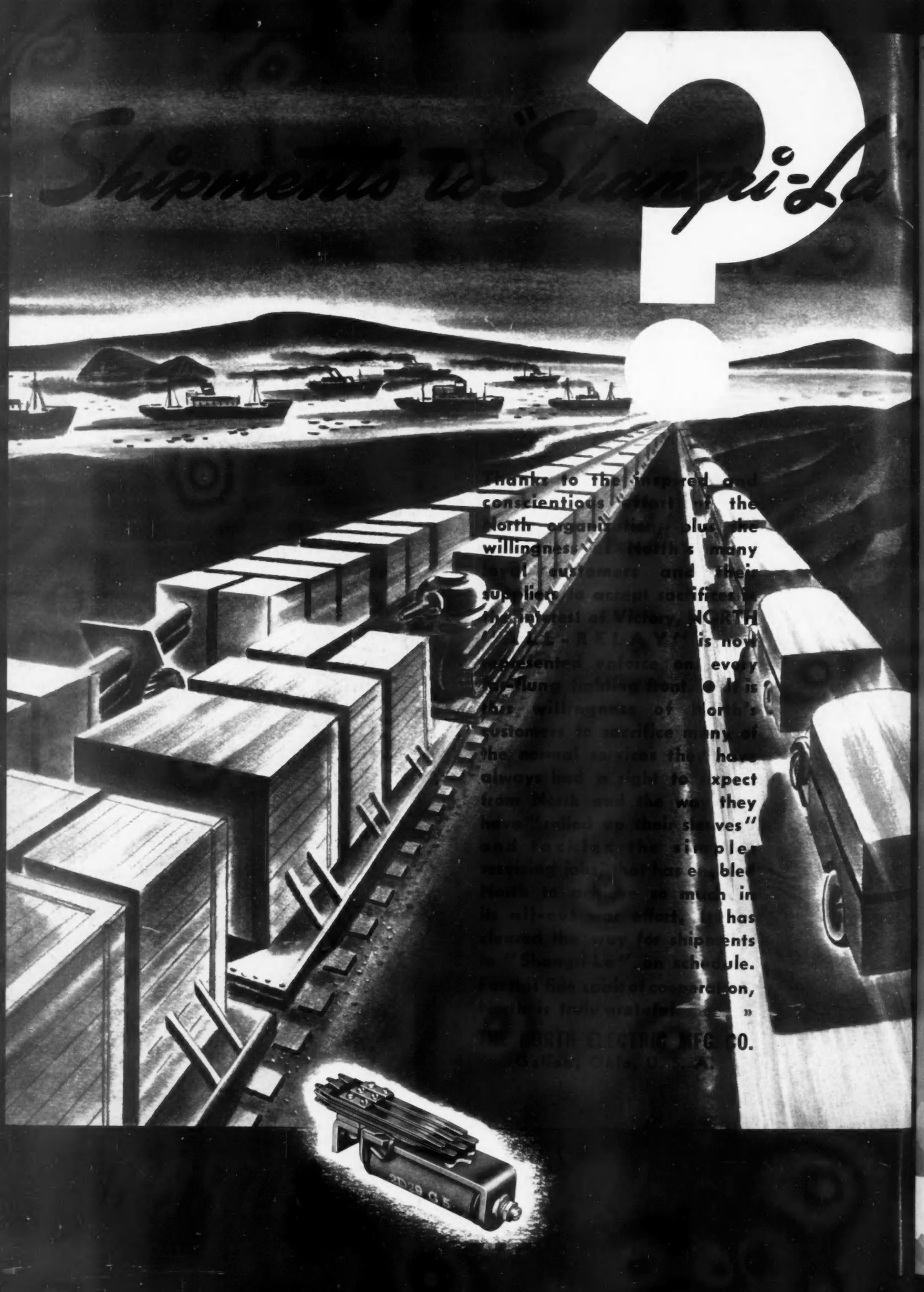
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